CREATING AN AGRICULTURALLY CENTERED CO-HOUSING AND MARKET RATE DEVELOPMENT IN PENDLETON, INDIANA.

A CREATIVE PROJECT

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Abstract

Creative Project: Creating an Agriculturally Centered Co-Housing and Market Rate Development in Pendleton, IN.

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The antidote to sprawl is to provide alternatives to the model of suburban living. Alternative communities are developing with greater density and greater proximity to where people work. Consumers are demanding a greater variety of housing options, not just a 'one size fits all' program of large homes on large lots. Even conventional subdivisions are including shared amenities to attract residents, yet there are greater opportunities to add value and community through shared property and land.

The focus of this creative project is to develop a site plan for an approximately 140-acre parcel of land located in Madison County, Indiana, 1 mile east of the boundaries of the Town of Pendleton. Most of the area is currently used for agricultural purposes, conventional row-cropped corn and soy alternating on an annual basis. Although the area currently falls within the jurisdiction of the Madison County Zoning ordinance, the comprehensive plan for the Town of Pendleton lists it as one of several areas being considered for annexation. Therefore, the creative project will address both land use control documents and description of future goals.

The project will first examine historical precedents that have informed alternative subdivision design. The site will then be analyzed using innate natural characteristics to determine areas most amenable to development. Using both precedents and site analysis, a development proposal is generated that outlines building program and phasing of project.

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"There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace."

(Leopold, 1949)

As Americans continue to turn inward to electronic devices and outward through the windshields of their cars, on may question whether we are losing touch with our historical and cultural identity. The automobile, once seen as the ultimate expression of American freedom and individuality, now consumes our free time. A Study by CEO's For Cities found that Indianapolis/Carmel, IN residents spent an extra 59 hours of the 166 hours of commute time a year due to sprawl (see Figure 1-1) (Cortright, 2010). In 2014, it is likely that more people have played Farmville on an electronic device than have actually visited a farm. Yet many Americans have a great desire to connect more with food, farms, and community.

"Have you ever wondered why the vast majority of neighborhoods in American towns and cities are missing a true sense of community? Residents share the place in name, and they pass each other in their cars each day as they come and go, but there's little real interaction" (Chapin, 2011)

Why do so many Americans feel disconnected from their communities, and why don't children walk to school or even know the names of their closest neighbors? Many contemporary planners like Andreas Duany and Randall Arendt argue that it is because contemporary suburban development has made all design elements subservient to the efficient movement of cars and platting of every developable square foot. This proclivity combined with ample greenfield development on the suburban fringe has pushed suburban development farther from city centers. Zoning designations that separate all land use types from one another exacerbates the effect of sprawl and leaves residents rushing between home and everywhere else (Figure 1-2) (Post, 1994). Visitors to these developments are bewildered by the lack of landmarks, the changing direction of roads, and the monotony of housing types often dominated by the garage door. This creates a lack of identity something James Howard Kunstler calls the geography of nowhere (Kunstler, 1993). While these late-20th-century developments century may have bucolic names like Walnut Ridge or Forest Meadows, little remains of the original ecosystem that provided the name.

Most new housing in these developments make no attempt to address either the nature of the site upon which it is placed nor the characteristics of the residents who live there. The most unifying element of the place is the income of the residents. Separating homes from school, work, and shopping causes even contiguous land uses to require use of cars, and no attempt is made to incorporate pedestrian transportation networks. Consequently, residents are forced to spend greater portions of their lives in cars moving from place to place. Statistics from the American

Figure 1-1 Sprawl Crawl: Relationship between sprawling growth and extra hours spent commuting. Diameter of circle indicates severity of congestion. Indianapolis ranked 10th worst. Sprawling growth is concentrated in cities in the Midwest and South with Nashville and Oklahoma city spending longest stuck in traffic.

Figure 1-2 The top of the diagram shows that multiple connections and centrally located schools, shopping, and work make collector roads a convenience, not a necessity. Sprawling growth with uses separated make the collector road the only travel choice for residents of sprawling growth.

Community Survey found that commute times have steadily crept upwards with more than 86% of Americans commuting by car (76% commute alone); average commute times in 1980 was 21.8 minutes, by 2000 it was 25.4 minutes, and by 2010 it had increased to 25.7 minutes. (McCann & Ewing, 2003) The original goal of planning, to separate incompatible uses, has been applied with such zeal that communities have lost the wisdom and insight that developed organically in the pre-automobile town. When designs subordinate everything to the convenience of the automobile, neighborhoods are built with roads like highways (Figure 1-3). Developers have exacerbated this problem by offering entire neighborhoods of one product type at one price point far from city centers on the suburban fringe.

Subservience to the automobile is not the only flaw in the design of contemporary housing. Homogeneity is another reason that modern day neighborhoods can leave one feeling adrift. New communities lack any distinguishing characteristics and have become bland versions of a mass produced commodity. Developers and home builders have become so risk averse that nearly every subdivision has become a homogenous product full of three bedroom homes designed for nuclear families that are increasingly rarer. These neighborhoods are differentiated only by the price point. While homogeneous subdivisions proliferate in the suburbs, this condition is conspicuously lacking in towns and villages that arose prior to the automobile. It is no wonder when every house in a neighborhood is designed around 3.2 individuals with a median income of $550-600 K, that these places would feel contrived and artificial, see Figure 1-4. The question remains whether these homes will retain their value or fall prey to the same decline that has occurred in many inner-ring suburbs. Society as a whole doesn't display such a bland sameness, why does contemporary home construction reflect such monoculture? Grandmothers, newlyweds, empty nesters, and spinsters all deserve housing that fits their needs. As the demographic characteristics of the US population shift away from large families, it begs the question whether the homes and neighborhoods being designed and built today will still serve the needs of the future homebuyer.

What is the solution? The solution is to design communities with a unique sense of place, that have centers and landmarks that create focal points in the community, that bring semi-private community spaces shared with neighbors back into the conversation, that are designed around people and not cars. While the context of the community will determine the particular form that these new neighborhoods will take (an urban setting will look very different from one that is rural), the design will be centered on people, not cars. While urban areas will look very different from rural ones, both will incorporate the same principles.

Why is this important to planning? Historically, community development occurred

Figure 1-3 Does this neighborhood need a 4 or 5 lane road?

Source: 'Mutations' Koolhaas, Kwinter, GSD

Figure 1-4 High earners turn left, everyone else turn right.

gradually, organically, and on a human scale. The automobile turned this paradigm on its head, a metaphorical gold rush for land on the urban fringe as speculators and developers have taken advantage of the increased mobility of homebuyers, and the principle of "drive until you qualify" has played out in Central Indiana along the I-69 corridor.

Impacts associated with Auto-Centric Development:

1. **Sprawling Growth.** By separating uses so divergently that one cannot possibly live without an automobile, sprawling growth is the outcome. Not only does this consume land inefficiently but also scarce community resources. Whether busing students great distances, installing sidewalks or water lines or, making public transport hopelessly inefficient, public spending cannot possibly keep up with sprawling growth.

2. **Environmental Costs**. Sprawl results in more vehicle miles, with most commuters the sole occupant in the vehicle. More trips in cars mean more emissions, greater distances between buildings means more energy expended for construction and infrastructure. Single-family dwellings are less efficient to heat and cool than multi-family or clustered housing. Roads, parking lots, and other impervious surfaces shift the infiltration of rainwater from the soil to storm sewers, culverts, and ditches which tend to exacerbate erosion, lower water quality in streams or rivers, and pollution in both surface and ground water. The voracious consumption of land for development, made possible by the automobile, has depleted productive farmland, recreational space, and native habitat.

3. **Public Health Costs**. A 2003 Article in the American Journal of Health Promotion linked sprawling communities with increased obesity and hypertension (Ewing et al. September 2003). The study examined development patterns in 448 counties with health characteristics for 200,000 residents in those counties. The counties were categorized from more sprawling to less sprawling and a difference of more than 6 pounds of body weight was found for residents of the most sprawling areas. By providing a safe network of pedestrian pathways residents want to use and connecting them with somewhere to go, people will no longer be obligated to use their cars but will instead satisfy these needs on-site.

4. **Loss of Community Cohesion**.- By providing residents with a sense of place that provides a focal point, people are brought together as a community. With conventional neighborhoods dominated by garages, privacy fences, and oversized roads people become isolated in their homes. This isolation shapes the family habits and results in neighbors that rarely congregate for a potluck dinner, help one another with childcare or pet sitting,

or check on an elderly neighbor.

Historical patterns of human settlement prior to the automobile era offer solutions to sprawling growth. Prior to the advent of the automobile, communities faced the same needs and obstacles. One difference between now and then is the mode of transport and scale of infrastructure to service that transportation model. Prior to 1900, communities were designed on a scale that enabled public transport or walking. Downtown Pendleton, Indiana, platted by Thomas Pendleton in 1830, was designed on such a pedestrian scale. Present day examples of communities designed around walkability are the exception, not the norm. Radburn designed by John Nolan and Village Homes built by Michael and Judy Corbett are both communities created during the automobile era but which prioritized pedestrian uses in their design. These communities often faced initial resistance from financiers and planners who were unwilling to think outside the conventional model, yet they were successful by providing an alternative that was attractive to consumers. Two of the most lucrative real estate markets in Indianapolis, Massachusetts Avenue and Broad Ripple, are legacies of when neighborhoods were designed for people not automobiles. New developments built in Central Indiana since 2000 are beginning to demonstrate the shift in consumer preferences. Projects like Saxony In Fishers, Indiana, Anson outside Lebanon, Indiana, and the Village of WestClay in Carmel, Indiana are applying principles of new urbanism in order to design communities that are alternatives to monoculture cul-de-sac subdivisions.

Another model of neighborhood design, known as co-housing, offers another alternative to the conventional subdivision. Pioneered during the 1970's in Denmark by Jan Gudmand Hoyer, bofaellesskab or living communities were modeled on Kibbutz, a form of cooperative community in Israel. These communities were in response to- parents and families feeling isolated in conventional apartments, rushing between work and personal lives, and a lack of community.

The creative project will first address historical precedents to develop design principles that will then be used to form a design proposal for a project on the site in Pendleton, Indiana.

Outline of the project:

1. **Chapter 1-Introduction**
2. **Chapter 2-Literature review/Precedent Studies** – An examination of historical and contemporary thinking in designing alternative communities. Among the designers and thinkers examined include: Ebenezer Howard, John Nolen, Lewis Mumford, Clarence Stein and Henry Wright, Jan Gudmand Hoyer, Ian McHarg, Randall Arendt, Judy and

Michael Corbett. Included will be co-housing communities such as Muir Co-housing or Trudesland. Agriculture subdivisions such as Prairie Crossing outside Chicago, Illinois and Tryon Farm near Michigan City, Indiana will also be examined.

3. **Chapter 3-Site Analysis**-The site analysis will apply Arendt and McHarg's design principles in order to determine which areas will be developed and which should be protected. On-site analysis will include soil characteristics, site hydrology, and ecosystems. The community will also be examined to determine the demographic profile of Pendleton and Madison County and existing building typologies in the area.

4. **Chapter 4-Building Program and Site Design**- The site plan will examine alternative designs, conventional design at maximum allowable density and a conservation design with clustered housing. The phasing of the project will be outlined along with plan view drawings of each phase.

5. **Appendix**- The Appendix will include photos of the site and surrounding community and information about Pendlteton psychographics.

Chapter 2: Precedent Studies.

In order to design a subdivision that avoids the mistakes of automobile-centered design, the designer must distill lessons from what was successful in earlier projects. The same problems that formed the genesis of the planning profession are still present today: providing space for housing, employment, nourishment, and services like transport, power, and water. By learning from past visionaries, the key elements can provide a framework for design. One early innovator was an unassuming parliamentary shorthand writer from England named Ebenezer Howard.

Garden Cities

First published in October 1898, Tomorrow: A Peaceful Path to Real Reform, and later renamed Garden Cities of To-Morrow, Ebenezer Howard's book has been called one of the most important books in Planning history. The book's publishing coincided with the beginning of the planning profession. Soon after the first garden city, Letchworth, was under construction with more cities planned in Germany. Yet in spite of his success, even his closest friend Frederic Osborn acknowledged that he was, "the mildest and most unassuming of men." (Howard, 2003) Born in London in 1850, Howard grew up in small southern English countryside towns, Ipswich and Cheshunt, which ingrained in him a great love of the country. Yet Howard was well travelled, spending time in the United States as a farmer in Nebraska and shorthand writer in Chicago, where it is thought he first developed the idea of the garden city.

It is important to remember the context during which Howard was forming his ideas. The industrial revolution had transformed the English countryside. Charles Dickens described the squalid conditions of contemporary London, England. Mathew Brady's photos brought home the horror of the American Civil War. Charles Darwin and Dmitri Mendeleev transformed scientific thinking. Karl Marx had disrupted economic theory and the first workers were unionizing. The ideas of Thomas Malthus were coming to fruition as evidenced by the Irish Potato Famine. In the United States newly freed slaves struggled to find a place in the economy and Railroad and Industrial barons were entrenching for conflict with organized labor. Populations in the industrialized world were moving to cities unprepared for the influx of people. Between 1871 and 1901, London, England added 1 million people a decade growing from 3.9 million to 6.6 million inhabitants. (Howard, 2003) The question of land ownership was an especially tricky problem for the Old World. Landless Europeans emigrated to the United States while the European powers divided up the rest of the world. In America, "40 acres and a mule", though seldom implemented, was the touted response to integrating freed slaves. In England, Howard was surrounded by thinkers like Alfred Russell Wallace who advocated for "three acres and a cow" (Howard, 2003) Howard recognized that the slum dwellers of London could not return to an agrarian life, but that through

Figure 2-1 Ebenezer Howard accounted for a practical financing structure for his idea of the garden city.

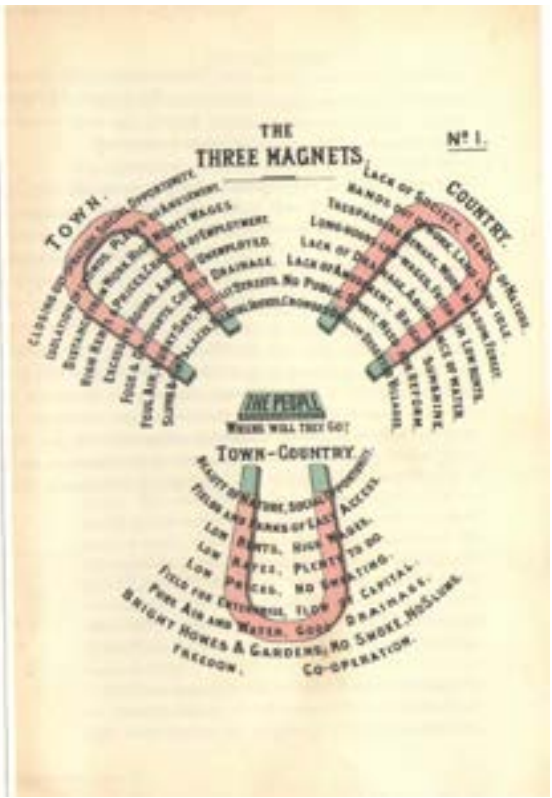


Figure 2-2 The Three Magnets demonstrated how city and country life each had its advantages and disadvantages. Howard believed that garden cities could incorporate the best of both.

creating carefully designed satellite cities, portions of the population could find relief from the overcrowded city. Technological advances were making it possible for industry to move out of cities and yet remain competitive. Rail, telegraph, post, electricity, and circulated newspapers all enabled communication and transportation to transcend some of the restrictions of distance. The travel writer James Silk Buckingham's National Evils and Practical Remedies, With the Plan of a Model Town, published in 1849, provided Howard with a template upon which to develop his own ideas of a planned community. In 1893 Howard was arguing for a "Co-operative Land Society" with enterprises owned by the municipal government. However he quickly realized that without the support of the wealthy and powerful he would be unable to obtain financing to bring his project to fruition. As a result, Howard synthesized many of these ideas into a progressive methodology that combined the self-sufficiency and profit motive of capitalism tempered with a greater level of collective ownership and responsibility (Figure 2-1). Investors were repaid first and then revenues were shifted into pension funds for the population.

Beginning with his three magnets diagram (see figure 2-2) Howard summarized the social problems bubbling to the surface of Victorian society. He believed that garden cities offered the marriage of the best of city and country life and was a response to two major problems of the era: 1. shifting overcrowded slums in the city to the country where 2. long agricultural depression had reduced land values and labor rates. With the three magnets, Howard demonstrated not only how to solve the problems of urbanization during the turn of the twentieth century, but also provided the justification for why people would be drawn to his garden cities. He then set out to design the layout for how such a city would be organized, demonstrated in Figure 2-3. "The astonishing fact about Howard's plan is how faithfully it follows the precepts of good planning a century later: this is a walking scale settlement, within which no one needs a car to go anywhere; the densities are high by modern standards, thus economizing on land; and yet the entire settlement is suffused by open space both within and outside, thus sustaining a natural habitat." (Howard, 2003) Howard's prescience foresaw urban growth boundaries long before Portland, OR had instituted this policy. At the point that a city reached a population of 32,000, a new city would be formed nearby. These cities would form a polycentric cluster of communities connected by a rail public transit system (Figure 2-4). Howard called these Social Cities and it is important to remember his concept of a garden city was part of a network not an isolated enclave.

Howard's concept included a financing structure similar to modern day tax increment financing (TIF) districts, i.e., future appreciation of land values through improvements facilitates the financing of initial infrastructure. Howard describes in great detail how increases in rents are able to first pay off the debt of construction and later provide for a system of welfare for the population. He realized that by satisfying the concerns of his financiers would his vision become

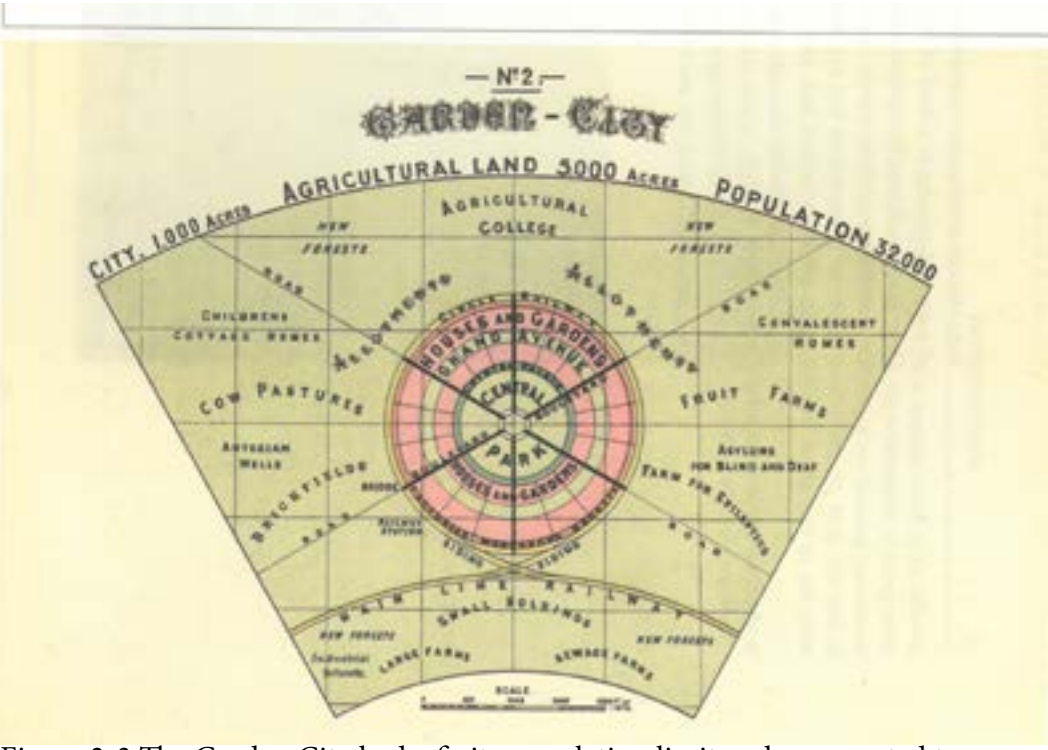


Figure 2-3 The Garden City had a finite population limit and was created to preserve agricultural lands while providing residents with amenities typically associated with much larger cities. His ideas presage the concept of urban growth boundaries.

Figure 2-4 Groups of Garden Cities were organized in a radial arrangement and enabled some cities to specialize yet collectively remain self-sufficient

reality (Figure 2-1).

Ebenezer Howard's ideas were a pragmatic solution to societal ills created by a rapidly urbanizing population. He recognized that both city and country living offered advantages and disadvantages, and sought to maximize the benefits while using careful design and planning to minimize the negatives. His concept was holistic, dealing with practicalities like financing and integrated industrial and food systems so that they could actually be implemented.

Clarence Stein and the Regional Planning Association of America- Radburn, NJ

Clarence Stein and Henry Wright brought the Garden City idea to the United States with the town of Radburn, New Jersey. Built in 1928, Radburn was also a response to the growing influence of automobile culture and its negative impact on community. The site plan for Radburn is shown in Figure 2-5 and demonstrates how integrated schools, green spaces, pedestrian and road networks, and stores were integrated in the design. Long before mixed-use was a planning concept, Stein and Wright recognized that a mixture of housing types and land-uses could be combined without ill-effect, with industrial uses separate but still in close enough proximity to enable workers to walk to work. The plan made excellent use of cul-de-sac street ends to create a sense of community (Figure 2-6); unfortunately, these would be copied countless times in the sprawling growth of the last 60 years with a very different outcome. The plan utilized clustered housing, a hierarchy of streets, commercial properties at the entrance, a school at the center, as well as clear separation between pedestrians and cars. They also recognized that the design should enable a progression from public spaces, important for commercial and industrial uses, to semi-private spaces such as neighborhood streets and greens, to private spaces occupied by single-family homes on individual lots.

Rexford Tugwell and Resettlement Administration

The Great Depression of the 1930's and President Franklin D. Roosevelt's New Deal program provided Rexford Tugwell the opportunity to translate Ebenezer Howard's ideas to create what became known as the Greenbelt cities in the United States. Three of these towns were built: Greenbelt, Maryland, Greenhills near Cincinnati, Ohio and Greendale, eleven miles outside Milwaukee, Wisconsin. The Resettlement Administration, much like the Civilian Conservation Corps (CCC), sought to solve unemployment by providing work for rural populations and using Howard's idea of leveraging depressed agricultural land values to transplant people out of slums. His progressive ideas garnered him the title "Rex the Red" (Gunderson, 2014) and the RA's program was found to be unconstitutional by the Washington D.C. Circuit Court of Appeals in Franklin Township V. Tugwell (1936). Though the towns have remained popular and have

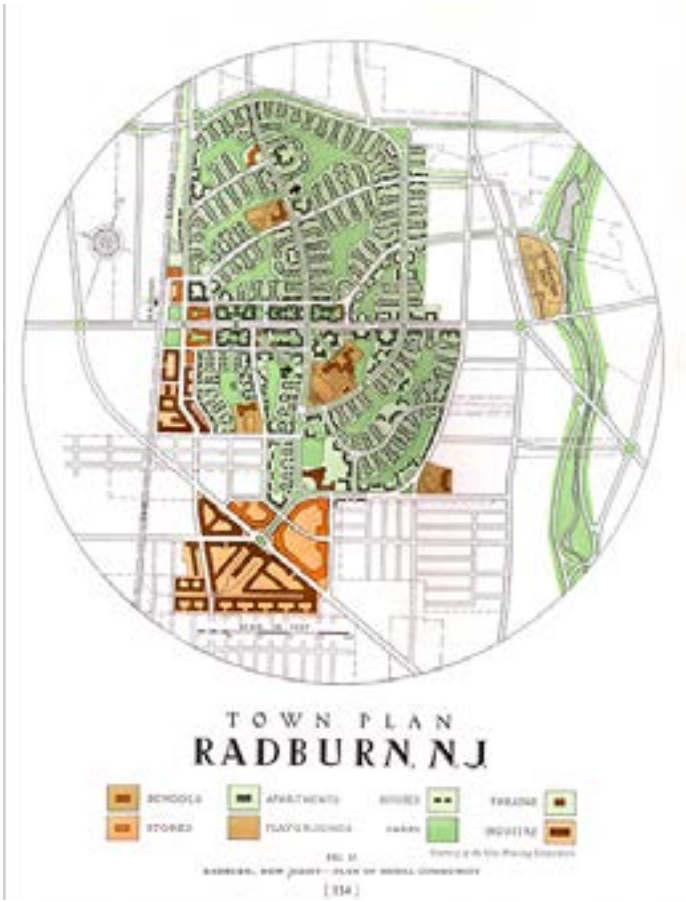


Figure 2-5 Town Plan for Radburn, New Jersey.

Figure 2-6 Birds-eye view of Radburn design showing separate networks of roadways and pedestrian paths. Cul-de-sacs on dead end roads preserve a hierarchy of semi-private space shared by homeowners

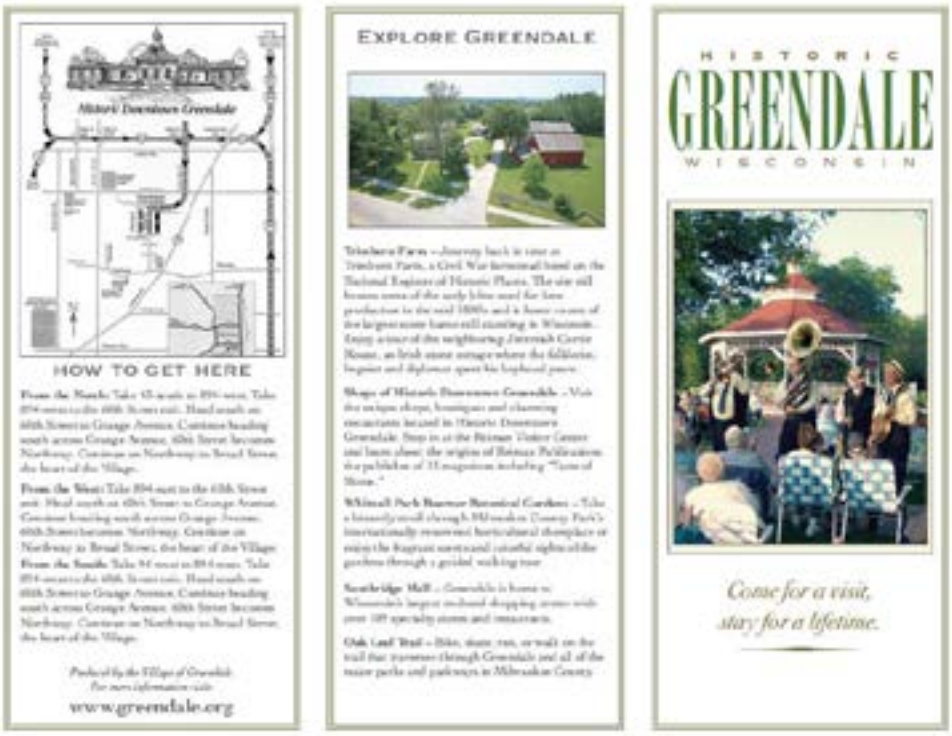


Figure 2-7 A contemporary brochure published by the Village of Greendale. The community integrated trails, shops, and housing for a variety of incomes.

Figure 2-8 Greendale's housing was laid out with shallow setbacks that front on shared green-space.

Figure 2-9 Planning for the town included accommodations for wastewater treatment.

retained higher property values than other comparable nearby towns only 3 were ever built. The town of Greendale, Wisconsin is listed on National Registry of Historic Places and publishes a brochure for visitors shown in Figure 2-7. Original drawings of a Greendale streetscape and the water treatment facility are shown in Figures 2-8 and 2-9. Much like Radburn, these cities were built on the principle of providing a mixture of housing for a variety of incomes, networks of paths throughout, and providing residents with shops and work close to home.

Village Homes- Davis California

In their book, Designing Sustainable Communities (2000), Judy and Michael Corbett describe the process of creating Village Homes in Davis, California. They started with an overall plan and set of design concepts and then left details to be worked out as development progressed, allowing for user feedback at each stage of the process. The initial plan and design concepts were originated by a small group of people who organized to define the principles of what a neighborhood should be. Advertised in the local paper and open to the public, the group of approximately 30 individuals began meeting in the early 1970's on Wednesday nights and came to be known as "the Village." Initially motivated by feelings of disconnectedness and environmental concern, the group disbanded prior to initiation of development, but not before outlining the design principles that would define what would become Village Homes. The design would include:

1. Energy Efficiency- homes would face south to maximize passive solar gain and minimize heating costs.

2. Interconnected- narrow, cul-de-sac streets would alternate with homes which open on toward shared greens that serve as bike/walking paths as well as drainage corridors to handle storm-water.

3. Sustaining- agricultural land-gardens and orchards would be interspersed throughout the property and provide both recreation and food.

4. Multi-faceted- parks, community center, childcare, and commercial centers would all be integrated into the community to offer something for all residents regardless of age.

These principles were then used to design the sixty acre parcel that would eventually become Village Homes, as seen in Figure 2-10. Nearly every aspect of the project was opposed by the Davis city staff. The city argued that streets were too narrow, setbacks too small, agriculture was incompatible with housing, and the natural drainage system was viewed as insufficient. The city required that to receive approval, they had to bond for a conventional storm drain system if their design failed. Houses were generally designed around clusters of eight houses. Once most of

Figure 2-10 Site Plan of Village Homes. The design incorporates a variety of elements common with the Radburn Plan. Cul-de-Sacs create pocket clusters, a network of paths separate pedestrians from cars, a commercial area provides employment and recreation for residents.

the houses had been purchased, owners met to design the shared common area. Neighborhood children were instrumental in designing playgrounds and most residents pitched in, providing some sort of sweat equity toward the success of the project. Once a critical mass of residents was reached, residents began to design the community center and pool. Again, residents participated not only in the design but also much of the construction of the pool, ensuring resident buy-in and ownership of community facilities. An "Adventure Playground" was built by the UC Davis Landscape Architecture Department using input from a children's "charrette" during the early 1980's (Corbett & Corbett, 2000).

Arguably, Public participation is greatest where people feel that they have a stake in the outcome. The layout of Village Homes took careful consideration of Oscar Newman's concept of creating defensible spaces. The majority of the site falls in the private and semi-private realm, "If a space is clearly designated as private or semiprivate, residents will act to protect it, whereas a "public" space is always seen as "someone else's" responsibility." (Corbett & Corbett, 2000) From the narrow winding streets, to the shared greenspaces, to the community gardens and playgrounds, whether they realize it or not, residents exert control over the neighborhood indirectly through the design.

Conservation design for Subdivisions by Randall Arendt

Beginning in the 1980's, Randall Arendt brought a conservation ethic to influence subdivision design in order to protect natural areas while still permitting development to occur. He called this new design paradigm conservation development.

A conservation subdivision is defined as a residential development where half or more of the buildable land area is designated as undivided, permanent open space. This is done by offering density bonuses to the developer to maintain density-neutral design, whereby the same number of lots are offered as if the parcel was fully subdivided (see Figure 2-11), however, the houses are placed in clusters on smaller lots with the majority of land held communally by a land trust or Homeowners Association (HOA.)

"The special places that give our rural and semi-rural communities their distinctive character need not all be cleared, graded, and paved over just because they contain flat, dry, buildable land, although that has been the fate of countless similar natural areas in virtually all suburbs built up to this time." (Arendt, Conservation Design for Subdivisions, 1996)

Arendt draws many parallels from golf course communities to conservation subdivisions in that half or more of the buildable land is designated as undivided permanent open space. The goal is retain the profitability of development while protecting the most biologically, culturally, or

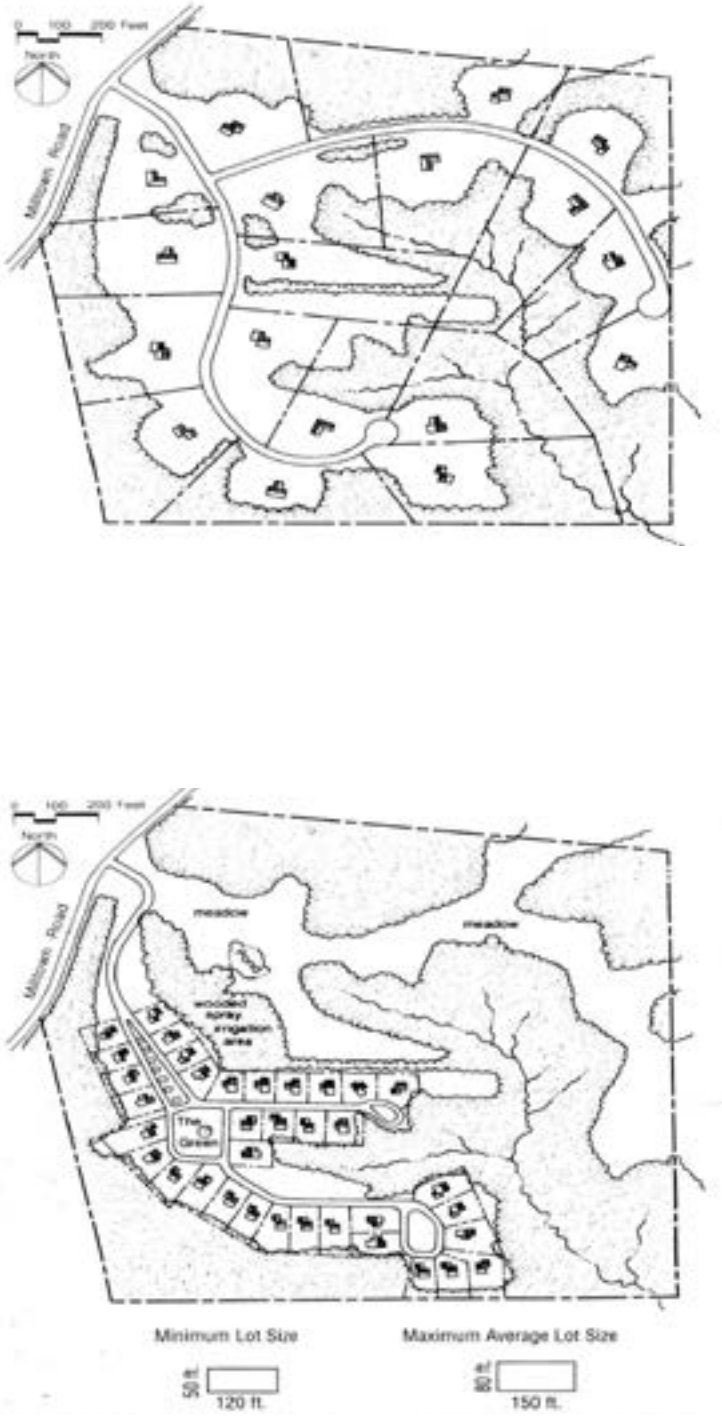


Figure 2-11 Conventional subdivision design (top) juxtaposed with Conservation Subdivision Design. The conventional design divides the entire parcel into equal sized lots. The conservation design maintains the same number of lots but on a much smaller footprint.

aesthetically valuable portions of a site. This is typically achieved in a density-neutral manner by designing residences more compactly, with smaller lots and homes reminiscent of traditional villages and small towns both in the United Kingdom and older areas of the United States. In order to determine the potential yield of a site, the developer first divides the site according to local land use controls after first subtracting areas unavailable to development, the primary conservation areas (PCA's).

Arendt describes 4 step process by which site plan is created. In some situations steps 2 and 3 can logically be reversed.

1. Designate open space.
2. Draw location of home sites.
3. Draw street layout.
4. Draw Lot lines.

When talking about typical exurban large lot developments of 1 or 2 acres, Arendt offers the observation that they are typically "Too large to mow but too small to plow." (Arendt, 1996) Rather than creating a large checkerboard of 1 acre lots, Arendt argues that a better use lies in continued agricultural production, conservation for wildlife, or preservation of historical and aesthetically appealing landscapes. Arendt seeks to balance the needs of developers and homebuyers with conservationists and area residents who wish to preserve the unique nature of rural living by offering a new methodology of development.

Arendt offers a critique of conventional subdivisions based upon 4 different criteria:

1. Typically produce nothing more than a checkerboard of parcels and streets to connect them,
2. Alternative methods of design can maintain the same density while creating more attractive environments that sell and appreciate faster than conventional subdivisions.,
3. Creating land protections inherent in the design of the project local review and approvals can be expedited,
4. Conservation subdivisions offer comparable open space allotments to golf course developments while preserving the natural ecosystem and offering a greater range of activities to a wider variety of users. Arendt points to the fact that between 40-80% of purchasers in golf course subdivisions are non-golfers and are purchasing

home sites exclusively for access to open space and wildlife (Philadelphia Enquirer, Sept. 26).

The design technique is derived directly from golf course design, namely to outline open space first and then use its size and shape to become the central organizing element in the rest of the design. In a golf course subdivision, open space is dedicated to fairways and greens, highly managed and manipulated environments that offer very little to native flora and fauna. Conservation subdivisions instead dedicate this open space to preserving the natural areas in their native state and to preserving habitats. The problem with conventional subdivisions is that because all available land is subdivided into private lots, community space is sacrificed to maximize lot size. Arendt states, "there are no open meadows for wildlife, or playing fields for children (of any age)…there is typically little community life, for the public realm has been reduced to an asphalt street system." (Arendt, Conservation Design for Subdivisions, 1996)

As with all subdivision design, the first step is to delineate "Primary Conservation Areas" (PCA's-un-buildable wetlands, water bodies, floodplains, and steep slopes) which are not subject to development. Arendt then adds a secondary layer of conserved land, "Secondary Conservation Areas" (SCA's-mature woodlands, upland buffers around wetlands and water bodies, prime farmland, natural meadows, critical wildlife habitat, and sites of historic, cultural, or archaeological significance). According to his methodology, a maximum of 50% of the site can be developed for residences, with the remainder of the site dedicated in perpetuity to open spaces. These open spaces can take a variety of forms and functions. They can be dedicated to wildlife habitat, passive uses like walking and bird watching, more active uses like playgrounds, riding trails, or athletic fields, or they can also be preserved for agricultural uses, or for preservation of historic or archaeologically significant areas. It is important to note that these areas are not wasted land but instead serve many purposes, foremost of which is adding value and marketability to the home sites. Residents choose to live there not in spite of the conserved areas but because of them. Particularly suited to this type of development, sites too small to accommodate a golf course (a minimum of 350 acres) but that contain significant open space worthy of preservation. Conservation subdivision design offers the ability to complement Traditional Neighborhood Developments (TND) and New Urbanist principles which are more appropriate in more urbanized areas. Sites not served by municipal water and sewer services benefit from Arendt's design process because they are able to consolidate these services in the clustered housing rather than being spread out on large lots that must each individually provide their own water and sewer service. "Occupying different positions on the rural-urban continuum, they both provide fresh solutions to the challenge of dealing with change in areas subject to growth pressures." (Arendt, Conservation Design for Subdivisions, 1996)

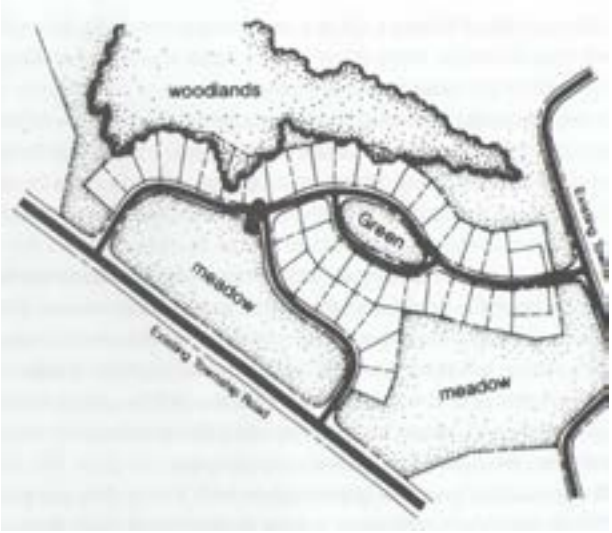


Figure 2-12 Conservation design preserves views and habitat in meadows and results in less infrastructure cost in installing roads and services

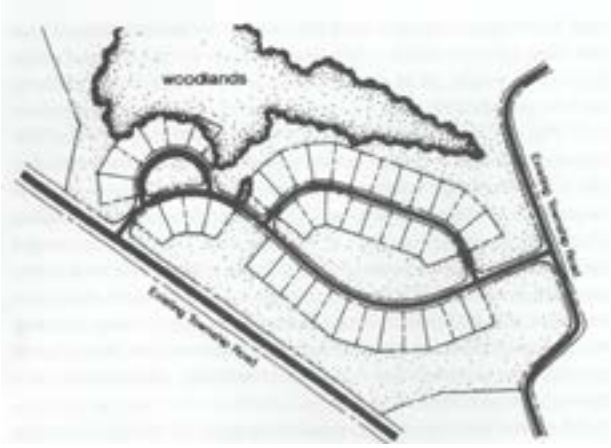


Figure 2-13 Conventional subdivision consumes habitat by converting meadows into backyards, and results in greater cost for roads and infrastructure.

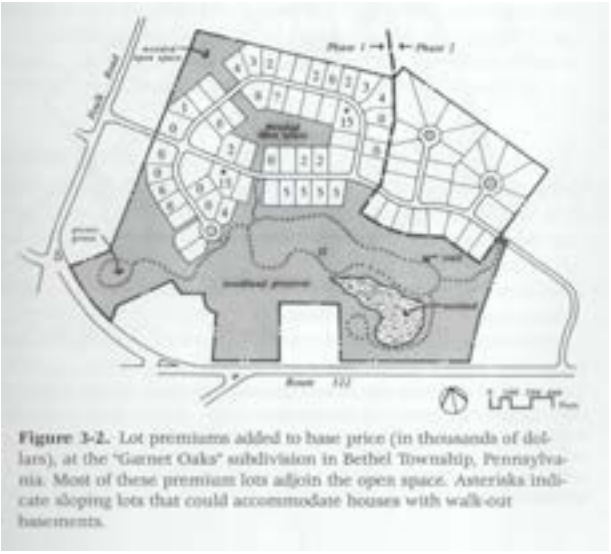


Figure 3-2. Lot premiums added to base price (in thousands of dollars), at the "Garnet Oaks" subdivision in Bethel Township, Pennsylvania. Most of these premium lots adjoin the open space. Asterisks indicate sloping lots that could accommodate houses with walk-out basements.

Figure 2-14 Careful design enables maximization of natural features to obtain premium sales prices

What advantages does conservation design offer over a more conventional approach to subdivision design?

1. **Smoother Review**- because the process is much more site context sensitive, designers of Conservation Subdivisions are more likely to anticipate problems that could result in delays or costly assessments required by local government. A higher quality of life in a community is now recognized to offer a competitive edge over other areas and municipal leaders are now aware that allowing sprawling housing developments to consume a majority of land puts their community at an economic disadvantage.

2. **Lower Costs**-because the distance between homesteads is reduced, it follows that infrastructure engineering and construction cost can be greatly reduced. Compact, village like development offers shorter street and utility runs to bring services to all residents and avoids the need for costly wetland or watercourse crossings because these areas are protected in the development. Storm water management costs are reduced and/or eliminated due to the ability of the site to manage all storm water. Shorter runs of infrastructure decrease long-term maintenance costs. When compared to the analog of golf-course subdivisions, the costs are even greater. Golf courses require major topographical changes and require significant earth moving. The contrived environment of a golf course provides very little habitat for native species and consumes vast quantities of water for irrigation while contributing herbicide, pesticide, and nutrient loads to the local watershed.

3. **Marketing and Sales Advantages**- many homebuyers are specifically looking for natural open space areas that offer views of nature from their residence. This is evidenced by the percentage of golf course residents who do not participate in golf themselves yet cite the open space as a factor in their home purchase. Amenities preserved onsite create a unique sense of place that contributes to the quality of life of residents and provides a marketing tool for the developer. Dedication of 50% of the site to open space enables home sites to be situated in clusters that afford unique views and don't suffer from the claustrophobia present in a more conventional subdivision (see Figure 2-12 and Figure 2-13). Although the density of built environment is similar in both the case of conservation and conventional subdivision design, the context is vastly different. Conventional subdivision design paints equal sized lots throughout the entire site (Figure 2-11). With a conservation design, the lots are laid out just as densely but in small clusters so the focus is divided between the home sites and the open spaces. It is important that an environmentally oriented marketing strategy capitalizes on all of these unique characteristics. Realtors should make customers aware that although they are directly purchasing an x sized lot (i.e. ½ acre

lot), they gain partial ownership, and use of, a large percentage of the site.

4. **Value Appreciation**- homes in conservation subdivisions have been shown to appreciate faster than comparable homes in conventional developments (a factor that could be used as a marketing tool). By carefully designing around natural features enables some lots to demand a premium price by incorporating those features (See Figure 2-14). A study of two neighborhoods in Amherst, Massachusetts with comparably priced homes, one with conventional design on half acre lots and no open space, the other with quarter acre lots but 36 acres of open space; found that after 20 years the lots in the conservation subdivision sold for an average of $17,000 more despite the smaller lot sizes. (Arendt, 1996)

5. **Reduced demand for new public parkland/satisfies park impact fee requirement**- by providing recreational opportunities and open space on-site, developers relieve pressure on municipalities to provide parkland for the added population from development. This factor can provide a leverage point for developers when seeking approval from planning commissions and local governments. The wider community also benefits from ecosystem services provided by preserved wetlands, forests and open space that help filter pollutants, infiltrate groundwater, reduce heat island effects, and absorb flooding.

Conservation subdivisions can also offer opportunities for more efficient wastewater treatment on site. Land treatment, spray irrigation, or wastewater reclamation and reuse are all different names for the same process which produces much less sludge by-product than conventional mechanical treatment. In the process wastewater is aerated in deep lagoons and then used to irrigate common areas where it percolates through the soil. Many golf courses use this technology to reuse water that would otherwise be diverted to municipal water treatment. Because of the flexibility in designing a conservation subdivision, the best soils can be reserved for septic treatment that poor soils would not accommodate. Arendt uses a technique pioneered by Ian Mcharg, of overlaying a series of maps to determine the best areas for conservation and best areas for residences. This technique has been enhanced by GIS software which enables the user to generate site maps more easily.

Ten layers constitute the factors at play in site design:

1. **Soils,**
2. **Wetlands**
3. **Floodplains**
4. **Slopes**

5. **Significant wildlife habitats**
6. **Woodlands**
7. **Farmland**
8. **Historic, archaeologically, and cultural features**
9. **Views into and out of site**
10. **Aquifers and recharge areas.**

Arendt drew upon his childhood and training in the United Kingdom to inform his design ideas. Contemporary planned communities and new subdivisions could learn many lessons from the historical layouts of country villages in the United Kingdom. Many of these places evolved over centuries yet many themes and elements are consistently repeated throughout all of them. One of the main principles is creating a sense of place by terminating vistas on key buildings or geographical features (Figure 2-15). Rather than allowing roads to pass unimpeded through the center of town, strategic bends and turns create squares and greens that serve as a focal point for community and reinforces sense of place. By creating different view sheds the traveler is afforded very different perspectives as they approach, pass through, and leave a town.

Historical examples of utilizing these same design patterns in the states abound. From small communities like Yorkship Village outside Camden, New Jersey to larger communities like Savannah, Georgia and Annapolis, Maryland. The effect is to create a distinctive sense of place through the layout of streets, greens, and public areas. More contemporary projects like Radburn in New Jersey, Chatham Village in Pittsburgh, and Village Homes in California use public space to create the focal point of community and therefore foster a shared experience for residents. Loop lanes, create a mini-neighborhood and allow a shared green to replace large front yards and offers an opportunity to install a rain garden (Figure 2-16) Rose walks, another idea pioneered at Radburn, are seeing renewed interest. These housing clusters are arranged around a small green space which can only be accessed by pedestrians but which is served by rear-loading garages off semi-private lanes. These designs have been successfully replicated at Belgravia Court in Louisville, Kentucky, Seaside, Florida, and even in central Indiana in the Village of WestClay, near Zionsville, Indiana.

Cohousing

Cohousing communities are structured around private homeownership and collective ownership of facilities such as a commercial kitchen, dining hall and gathering space, community

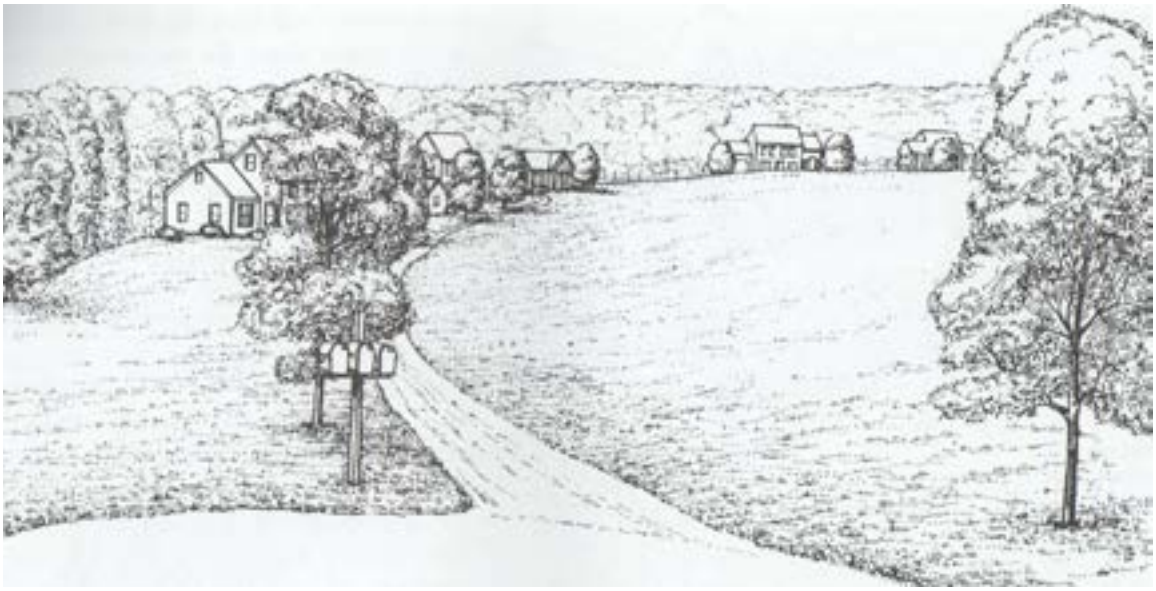


Figure 2-15 Elevation drawing of home sites arranged around a meadow. Residents and visitors are greeted by a natural vista rather than the backs of houses

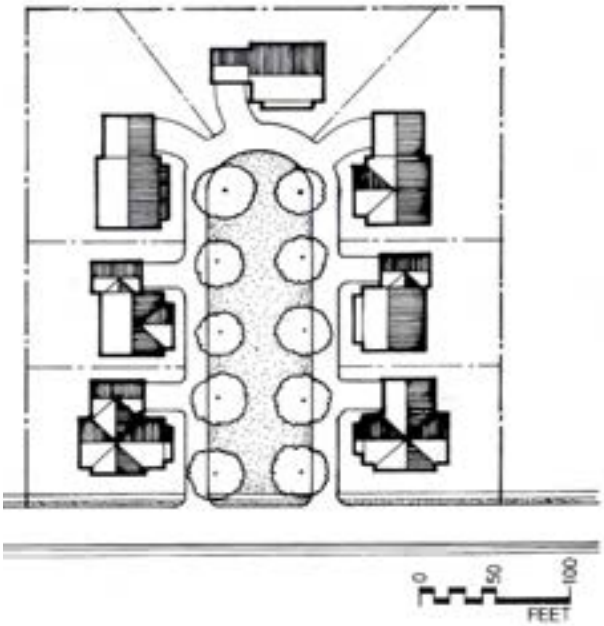


Figure 2-16 Loop Lanes create a miniature neighborhood of 7 to10 houses.

garden, playgrounds, workshops, exercise areas, swimming and recreational facilities, and even short term housing for guests or visitors. Co-housing residents frequently mention that community members feel a part of a large extended family and this is put into practice with shared meals on a regular basis, community governance, and sometimes even design of the community. Co-housing communities integrate all design elements of cluster subdivisions and pocket neighborhoods.

In the early 1970's Jan Gudmand-Hoyer, a Danish architect, began building communities designed around the principle that future residents should be instrumental in planning and designing the community from the outset, "Not only houses for people, but also, houses by people." (Chapin, 2011) The Danish call cohousing "Bofællesskaber" or "living communities" and by 1993 more than 140 of these communities had been built in Denmark. Danish society was changing, more families had both parents working outside the home and while apartments and single family homes offered greater privacy, they led to isolation and lack of community. By involving residents throughout the entire process, residents moved into their newly built homes with an intentional community already established. Co-housing should not be confused with communal living or communes, which are generally organized around shared religious beliefs, charismatic leaders, and all property held jointly by the entire group; cohousing communities are much more egalitarian and homes are owned privately by individuals, with common areas held in trust. One of the difficulties found early in the formation of co-housing communities in Denmark was the arduousness of their planning. The process of gaining consensus was often too difficult and lengthy for many individuals. "For every ten families who want to live in cohousing, there is only one that is prepared to take on the burden of the planning period, and for every ten of those, there are only a few who can take the initiative." (Scotthanson & Scotthanson, 2005) More than three decades of cohousing experience in Denmark have led to a streamlining of the collaborative process. Early projects took between 5 to 8 years to come to fruition, today they can generally be accomplished in 2 years.

Trudesland, a community of 33 families north of Copenhagen was completed in 1981. As one of the first cohousing communities in Denmark (at its inception 8 other cohousing communities had been created) the community faced many obstacles. Government officials and financial institutions were resistant to the project and the process of defining community goals led to half of the original members leaving. One of the primary motivations for the residents was creating a place where children could safely play and interact with the wider community. "Our primary motive for wanting to live in a community was the desire for a richer social atmosphere-for both children and adults. The many practical advantages which we later discovered, we hadn't even thought of in the beginning." (Scotthanson & Scotthanson, 2005)

Figure 2-17 Site Plan for Muir Commons Cohousing.

Figure 2-18
Residents lay out the neighborhood using a table top mock-up.

Muir Commons Cohousing- Davis, California. Within a quarter mile of Village Homes, 26 condominiums organized around a central green and 3,700 ft2 commonhouse sits on a 2.9 acre site (Figure 2-17). Built in 1991, the development was the first cohousing project built in the United States and was a collaborative effort between residents, the developer (West Davis Associates), and The CoHousing Company. The city of Davis was requiring that the developer set aside 25% of its housing to be affordable to moderate income families and West Davis Associates felt that cohousing offered an opportunity to fulfill that obligation. Therefore, it was the developer that approached the resident group with the site in mind, which saved the group much of the legwork associated with a cohousing project including site acquisition, hiring professionals, securing financing, and finding residents. However it decreased some of the control the residents had in the design process. This factor was a double edged sword, because gaining consensus among residents often adds significantly to the timeline and therefore the cost associated with a cohousing project and the developer was under pressure to get the project built. This expedited the project and that likely contributed to the project's success but constrained some input from future residents. Input from the CoHousing Company not only streamlined the project but added to the voicing of resident's desires. Residents were able to influence site layout, common house design, and private house design. After a series of public meetings, a 20 page program of goals, activities, and spaces received group consensus approval and allowed residents to take ownership of the community. The group used plans of the vacant site, wood blocks and tracing paper to "try out" a variety of different layouts for the site, see Figure 2-18. Another interesting technique involved laying out the floor plan of a house to scale with string in an empty lot , residents were then able to visualize the space by moving furniture around in the "rooms." Having an experienced advisor to facilitate discussion enabled the group to present a unified opinion to both the developer and architect. By pointing out inconsistencies and contradictions the group was able to avoid pitfalls that might have been easier to put aside and deal with later. For example, the group was asked to consider their relationship to surrounding neighborhoods, even those that weren't yet built. One resident remarked on the collaborative process, "It demands constant practice, but over time we've developed an almost instinctive understanding of how to handle tense situations and difficult challenges. It's been fascinating to see a group of people who knew very little about process emerging with a mature way of making decisions." (Scotthanson & Scotthanson, 2005)

Kraus-Fitch Architects-*Mosaic Commons and Sawyer Hill Development*

With almost 20 years of experience running workshops that help cohousing groups create consensus and design successful communities, Mary Kraus and Laura Fitch are leaders in creating alternative communities. Their participatory design workshops are typically weekend long char-

rettes that "balance and optimize the gathering of information, interaction between future neighbors, eliciting of dreams, and communication of our knowledge of cohousing design and living." (Kraus Fitch Architects, Inc.) With so much to accomplish in one weekend, participants are asked to complete preparatory work, or homework, which outlines key questions about the site, common facilities, and or design elements. Asking participants to reflect on the design brings greater clarity when the charrette begins. Often participants are asked to bring images to develop an aesthetic theme to the charrette. The sessions usually begin on Friday nights with a slide presentation tour of other cohousing communities around the country. These slideshows trigger a question and answer session and enables the group to socialize with each other and the architects. Both Saturday and Sunday are then used to run several workshop exercises including:

1. **Site analysis**: including walking the site and observing positives and negatives,

2. **Imaging exercises**: guided visualizations during which members imagine different activities occurring around the site,

3. **Small-group discussions**: smaller groups enable quieter members to have their voices heard as well as facilitating consensus by winnowing out sub-par ideas. Small groups will then come together as a whole to discuss the conclusions arrived at in the breakout sessions. In order to visualize different layouts, groups use scale blocks to layout individual units and the common house on a hands-on model of the site plan in order to see patterns that emerge in different layouts. The same technique is used to design the common house.

4. **Visioning statement**: the group works to develop a vision statement that drives both marketing materials as well as informs development and design. Following the workshop, the architects design schematics which provide several alternatives to the group. After deciding upon one of the alternatives, a final site plan is drafted and construction documents are created.

Pocket Neighborhoods by Ross Chapin

"In a pocket neighborhood, there is a collective sense of ownership that extends beyond the front yard gates to the edge of the shared commons at the street. A guest or stranger will feel this territorial sense as soon as they enter the commons." (Chapin, 2011)

Chapin believes that a front porch is a key design element in any pocket neighborhood design because it serves as a bridge between the privacy of the household and the publicness of the street. Elaborating on Jane Jacob's concept of "eyes on the street", the porch serves as the interface between public and private and is a visual reminder that community members are present. Contrast this with neighborhoods dominated by rows of garage doors, the feeling that anyone is

paying attention to activities on the street is largely absent.

In designing a cluster of houses, Chapin applies several key concepts which contribute to a sense of place and community. Because the density is often higher than surrounding neighborhoods, houses are smaller with more careful detailing and built-in storage. Each individual house is unique and adds to the individual character of the cluster of houses. Cars are corralled or hidden; semi-private alleyways provide rear loading or detached garages (possibly with a granny flat above) or parking areas are clustered together to serve multiple houses. Windows in the houses are carefully laid out so that neighbors aren't looking into one another's houses, yet public spaces are clearly visible from all houses. This can be accomplished by nesting housing together with creative design, like z-lots, zipper lots, and alternate-width lots. The open side of one house should front the closed face of its neighbor.

Often, pocket neighborhoods will have houses with individual names, sometimes prominently displayed on the front porch . This contributes to the feeling that visitors arrive to a unique place, not just an address.

Common greens and common housing facilities should form the heart of the community and designed in such a way that all residents feel welcome to use them. A commons building provides a space for potlucks, card games, exercise classes, or summer movie night. Residents no longer need space in their private homes to host a party when they can reserve the common use for such purposes, so the downsized proportion of the houses is less of an obstacle to potential homebuyers. The common house is generally designed with large outdoor patios or decks to complement interior space and also serves to bridge the zone between the public street and the interior of the courtyards.

Poplar Commons, in Boulder, Colorado serves as a model for what affordable housing can look like. Built upon a similar model that Habitat for Humanity has capitalized upon, the residents helped to subsidize their housing by providing sweat equity into their own homes. To maintain affordability over the long run, some controls are placed upon how soon purchasers are able to resell their homes. When residents are asked about their community they generally reference the camaraderie that developed building one another's houses as a foundation for the neighborhood.

Designing with the needs of children is another element common to all pocket neighborhood designs and makes use of the continuum of private to public space built into the housing layout. Both parents and children are comfortable venturing into the common areas because neighbors know one another and policing is a cooperative effort of the community. Jane Jacobs

recognized that neighbors watching out for one another is the difference between creating a safe community and a dangerous one. "Given that only half of the hours of a child's waking day—and half the days of a child's year—are spent in school, the neighborhood where a child grows up is crucial in supporting that child's needs" (Chapin, 130) Great emphasis is placed upon making radiating zones of play appropriate for children of different ages. Creating safe, unstructured communal zones is an important element to developing confident, inquisitive children and enables children and adults to interact. This interaction can be just as beneficial to the adults as the children's enthusiasm and spontaneity influence adults. Chapin states that children are arguably the social glue that that holds the community together and therefore will be the most visible aspect of pocket neighborhoods.

Figure 2-19 An overhead transect of the continuum of density from rural to urban.

Smart Growth Zoning Codes: A resource guide sets a up a system for planning and designing growth along a transect from rural to urban. The authors seek to elaborate on Andrès Duany's use of ecological principles to guide growth along a continuum of densities. "Most urban and suburban communities evolved from being rural. And if they are to follow smart growth principles, many communities in areas with growing populations should be in transition from one zone to the next, from less to more intense urbanism" (see Figure 2-19) (Tracy, 2004) The proposed site in Pendleton, Indiana lies in one of these transitional zones. Although the area has a long history of agricultural production and continues to be rural in character, many contiguous parcels have been converted into residential areas with the expansion of Pendleton eastward. The author advocates for a transition away from use-based codes to type-based codes that will allow a greater flexibility of future uses. By prescribing a set of design principles, a goal of smarter growth is achievable which seeks to ease the transition toward urbanization. Ideas that should guide planners toward this end include:

1. **Walkability**-

    a. design neighborhoods which can be walked from edge to center in 5 to 10 minutes

    b. on sidewalks or paths

    c. on a network of streets that form an interconnected grid

    d. short blocks

    e. narrow streets

    f. planting strips and street trees to separate traffic from pedestrians

    g. creative parking strategies and lower requirements, share parking between uses

    h. commercial areas should have parking located behind or to the side of building and buffered sidewalks in the front

    i. visibility into all commercial buildings and out of all buildings onto public areas. (eyes on the street)

2. **Diversity**-

    a. Provide a variety of housing types and with commercial, retail and civic uses interspersed.

    b. Prominent public features should serve as navigation points

    c. Offer housing designed for a variety of age cohorts and family size

3. **Sustainability**-

    a. Provide a variety of active and passive recreational opportunities on site and encourage residents to use pedestrian pathways by making them convenient and interconnected

    b. Encourage energy efficiency in building design and construction

    c. Foster density levels that support public transportation and design around

the pedestrian rather than the automobile.

Case Study Site Plans:

Tryon Farm, Michigan City, Indiana

The development is marketed as built "with Mother Nature" (Figure 2-20) and uses many of the conventions proposed by Arendt, Chapin, and Howard. The 170 acre site includes a common facility in a restored barn, clustered houses with shared greens and pathways throughout. Berm houses are built around a central pond with material excavated onsite. On-site wastewater treatment in constructed wetlands handles the community's wastewater (Figure 2-21). The majority of the site is dedicated to conserved woodlands, meadows, and dunes that are shared and protected by the community. A bed and breakfast and working farm contribute to the atmosphere and vitality of the community (Figure 2-25). A contemplation garden and community gardens are available to long time residents. The community sponsors events (e.g. Trail runs on the property), hosts educational/community programs and private events, like weddings in the picturesque setting. The business is structured with many levels including the developer, Ed Noonan, the residents governing body (the HOA), and a non-profit, the Tryon Farm institute involved in managing the land trust and educational outreach. The homeowners association also has a voice in protecting the shared resources as these add significant value to the whole community. The berm houses are extremely energy efficient both summer and winter, blend into the landscape, and were constructed using materials dredged out of the pond and soil excavated to construct the wastewater wetlands (Figure 2-24). The self-guided tour map shown in Figure 2-20 demonstrates how the majority of the site is dedicated to nature preserve, stream course, and meadows. Only a fraction of the site will ever be developed and this adds to the value of parcels that are. The housing in the famstand Settlement shares a parking court, with garages tucked under the towering units. A common mail area facilitates the mailperson's life and the community's connections (Figure 2-22). The homes at Tryon Farm are relatively expensive considering their small size; however the value lies in all of the surrounding land that comes with the purchase. Many of the residents are Chicago residents who own a second-home at Tryon. The Barn hosts events and the main office and outside, a newly installed natural swimming pool which doesn't require chlorine. (Figure 2-23)

Figure 2-20 Site plan/Trail map for Tryon Farms.

Figure 2-21 Photos of wastewater treatment wetlands at Tryon Farms.

Figure 2-22 Common gardens and area for parking and mail delivery at the Grove Settlement.

Figure 2-23 Newly installed natural swimming pool.

Figure 2-24 Berm Houses in the Pond Settlement: Summer (top) and Winter (bottom).

Figure 2-25 Bed and Breakfast in converted farmhouse.

Inglenook, Carmel, Indiana

Designed by Ross Chapin, Inglenook is being developed on Indianapolis' north-east-side. The site plan for the development appears in Figure 2-29. The development at East 99th and Maple Drive in Carmel, Indiana uses zero-lot line parcels turned not toward the street but a common green, see Figure 2-27. The houses are designed so that windows don't face into one another but are staggered enabling a tighter spacing of houses. The garages are accessed from rear-alleyways, see Figure 2-28. The houses all have front porches and despite being smaller than typical houses built in the area, don't feel small due to attention to detailing and extensive built-in cabinetry . The site is designed to de-emphasize the automobile's presence and replace it with bite size clusters of houses where it is possible to know one's neighbors. The 27 cottage-style homes are all clustered around 3 different greens with some sites accessible only from the rear alleyways . The developer is currently building two homes speculatively and three home sites remain unsold. Buyers choose from among 7 different home plans, all designed by Ross Chapin with names like The Betty Sue or The Madrona. The website features testimonials from residents, floor plans, and an assortment of pictures from the homes and neighborhood.

Figure 2-26 Site Plan for Inglenook.

Figure 2-27 Houses face common greens at Inglenook near Carmel, IN.

Figure 2-28 Garages load from rear alleyways.

Prairie Crossing, Grayslake, IL

Prairie Crossing is one of the largest and most commercially successful alternative developments in the U.S. Creating the development was not without difficulties, as the developer encountered resistance from the surrounding community. Sometimes collaborating with neighboring residents and reducing resistance to a project is equally important to working with future residents to ensuring the success of a project. Initially envisioned with more than 1,600 units, the project underwent a 15 year battle with neighbors. Only after the project was reworked as a 362 unit project with more than 70 percent of the site dedicated to open space was the project able to overcome its detractors and receive approval (see Figure 2-29). Although the site was not designed with direct input from future residents, its focus was primarily on community principles of education and farming. The design elements of the project appeal to a wide-ranging group of people. Houses were designed with energy-efficiency in mind, Figure 2-31. The first 12 houses built serve as a community-scale demonstration project for the U.S. Department of Energy's Building America program which use half of the energy of similarly sized homes in Chicago. The developers sought to provide housing for a variety of different incomes and family types with a public train station on one edge of the property and a second station planned. Mixed-use is put into practice at the development; the site design includes a charter school (see Figure 2-32), hospital, two commercial areas with retail, restaurants, offices and multi-family housing. Much like Village Homes, site design began with an assessment of natural topographic features in order to handle all storm water on site. The "Storm water Treatment Train" included open swales, prairie biofiltration, wetlands, and a man-made lake all of which help to treat and capture pollutants as well as allow greater infiltration of precipitation and replenishment of aquifers (See Figure 2-30).

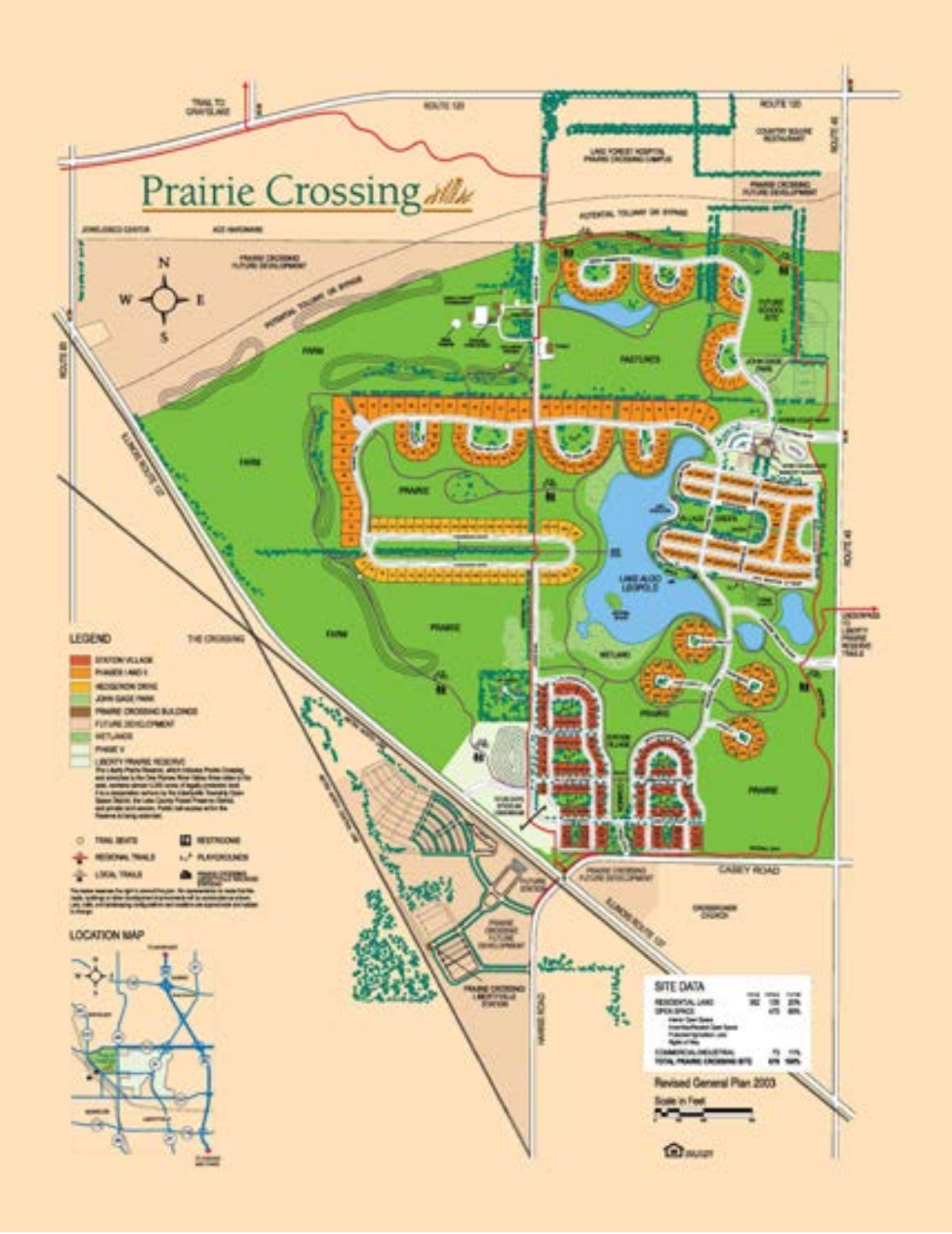


Figure 2-29 Prairie Crossing site plan.

Figure 2-30
Stormwater is handled using natural features on-site.

Figure 2-31
Energy-efficient housing at Prairie Crossing.

Figure 2-32
Existing buildings were retrofitted to find new uses, in this a barn was converted into a school.

Chapter 3-Site Analysis

Pendleton, Indiana is situated in East-Central Indiana in Madison County approximately 10 miles south of Anderson and 27 miles northeast of Indianapolis (see Figure 3-1). The town's rural character and agricultural heritage are sources of identity and pride for the residents. As the metropolitan area of Indianapolis has expanded north and east along I-69, the town's identity is seen as under threat from suburban expansion. The Comprehensive plan for both the community of Pendleton and Madison County prioritize the preservation of agricultural land over residential uses. (Madison County Council of Governments, 2006) (Planning Commision, 2000)

Figure3-1 Regional map showing Pendleton in relation to Indianapolis.

By Right Analysis:

Although the site lies less than 1 mile from the incorporated boundary of the town of Pendleton, zoning regulations for the site are defined by the Madison County zoning ordinance. The comprehensive plan for Pendleton includes the site within an area being considered for annexation, however, in an interview with Tim McClintick, town manager for Pendleton, no annexations are currently planned and the town does not exercise extra-territorial zoning to influence land uses contiguous to its boundaries. (McClintick, 2014) The Pendleton zoning map is shown in Figure 3-2 with nearest uses dedicated to two family housing, planned business, and public institutions (including the local middle and high school). The zoning map for Madison County is shown in Figure 3-3, with the site occurring in the middle of a large block of agriculturally zoned land. Minimum lot size for this zoning is 1 acre and minimum living area for primary dwelling structures is 1,500 square feet. Many of the surrounding parcels to the site are not in compliance to the existing zoning but were legal under prior zoning. The site will require a re-zoning to a planned unit development in order to cluster housing at greater density than currently permitted. While the overall site will retain similar density as permitted by the current zoning, the clustering of housing will result in the types of densities that make mixed uses

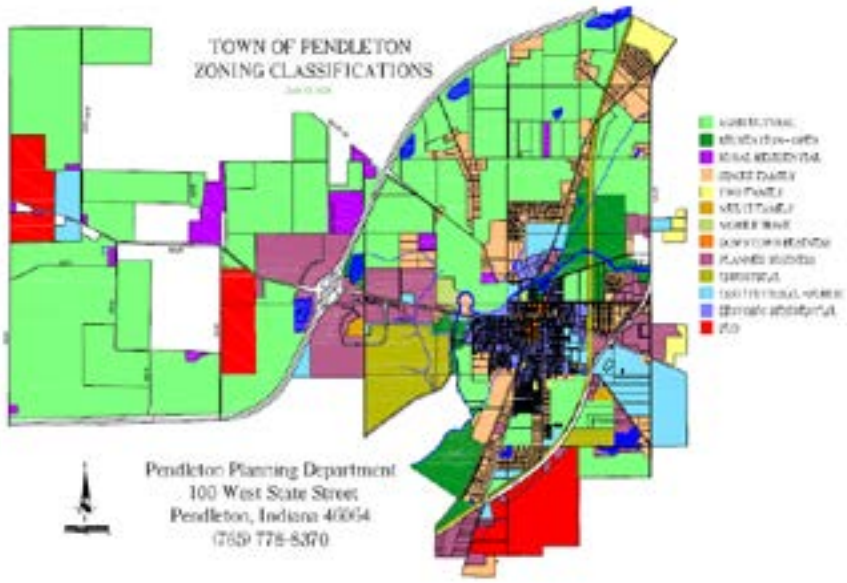


Figure 3-2 Town of Pendleton zoning map, site is located outside boundaries of map, approximately below key.

Figure 3-3 Madison County zoning map for areas around site. Site has been highlighted by teal overlay.

possible and preserve agricultural land for production.

Proximate uses: The property lies on the eastern edge of the town of Pendleton, on the transition between residential and agricultural land. Along the northern edge, bordering US Highway 36, ranch homes built during the 1950's occupy larger lots of 1/3-1/2 acre. These homes have an average value between $70,000-100,000. To the west, newer ranch and two story homes built during the 1990's comprise one of the newer neighborhoods in Pendleton, The Merry Hills Subdivision. These newer homes have an average value of $150,000-200,000. This 22.5 acre subdivision contains 55 homes. To the east, the 33 acre Falcon Crest subdivision is composed of 66 homes and was built during the 1970's. Both of these subdivisions are currently served by municipal water services but neither is served by municipal wastewater treatment with all lots on septic systems. The remainder of the land to the south and east is agricultural land with older farm houses on large parcels. A historic Quaker Meeting house, established around the same time as the founding of the town, circa 1820, with a historic cemetery lies ¼ mile to the southeast along the Spring Branch of Fall Creek. Several large estate homes are located to the west along S. R. 38 and as of spring 2014, were appraised at $500,000-700,000 (see Figures 3-4, 3-5).

Circulation: The site is accessed by two different 2 lane highways: U.S. 36 and State Road 38. State Road 38 bisects the southern half of the site and connects Pendleton with Markleville, 7 miles to the east and New Castle to the southeast, 21 miles. U.S. 36 runs east 51 miles to the the Ohio border. Traffic counts completed by the state in 2008 are shown in table 3-1 and show that neither road is overburdened by existing traffic flow. (ESRI Business Analyst, 2014)

State Road 38	S. Woodrow Dr.	5,008
State Road 38	S. 300 West	5,978
State Road 38	Ann Avenue	4,361
U.S. 36	S. 150 W	7,210
U.S. 36	S Woodrow Dr.	8,630
U.S. 36	S. 300 West	7,946

Table 3-1 Traffic counts near site from a 2008 study conducted by Indiana Department of Transportation

The roads around the site are rural highways with low density development and high speeds. To the west, land uses are changing as Pendleton housing grows outward from the town (early 2000's). To the east, land uses continue to be dominated by agricultural uses. During the autumn of 2013 State Road 38 was improved with the addition of a roundabout added at the intersection of S. 300 West in order to facilitate access to Pendleton Heights Middle School. Although the site is not currently served by

(A.)7481 S 250 West
Parcel: 5.0 acres
House: 3,544 square feet, 2 Bedrooms 1 full bath
Built: 1978
Detached Garage: built 1994, 1,472 square feet
Assessed value: $126,400
Last Sold: No record

(B.) 7283 S 250 W
Parcel: 2.0 acres
House: 1,485 square feet, 3 Bedrooms 1 full
Built: 1947
Bank Barn: built 1950, 1200 square feet
Assessed value: $136,600
Last Sold: no record

(C.) 7510 S 250 W
Parcel: .88 acres
House: 1,530 square feet, 2 Bedrooms 2 full baths
Built: 1999
Assessed value: $297,700
Last Sold: no record

Figure 3-4 Housing near the proposed development.

(D.) 2800 W. SR 38
Parcel: 4.9 acres
House: 3,544 square feet, 2 Bedrooms 2 full, 2 half baths
Built: 1973
Bank Barn: built 1938, 1772 square feet
Assessed value: $297,700
Last Sold: 11/19/2012 for $525,000

(E.) 2560 W. SR 38
Parcel: 3.38 acres
House: 2,214 square feet, 3 Bedrooms 3full,baths
Built: 1868
Pole Barn: built 2003, 1520 square feet
Assessed value: $196,400
Last Sold: 06/04/2013 for $196,000

(F.) 2627 W. SR 38
Parcel: 5.0 acres
House: 4,846 square feet, 3 Bedrooms 3 full, 1 half baths
Built: 2003
Bank Barn: built 1938, 1772 square feet
Assessed value: $347,900
Last Sold: no sales history

Figure 3-5 Housing near proposed Development.

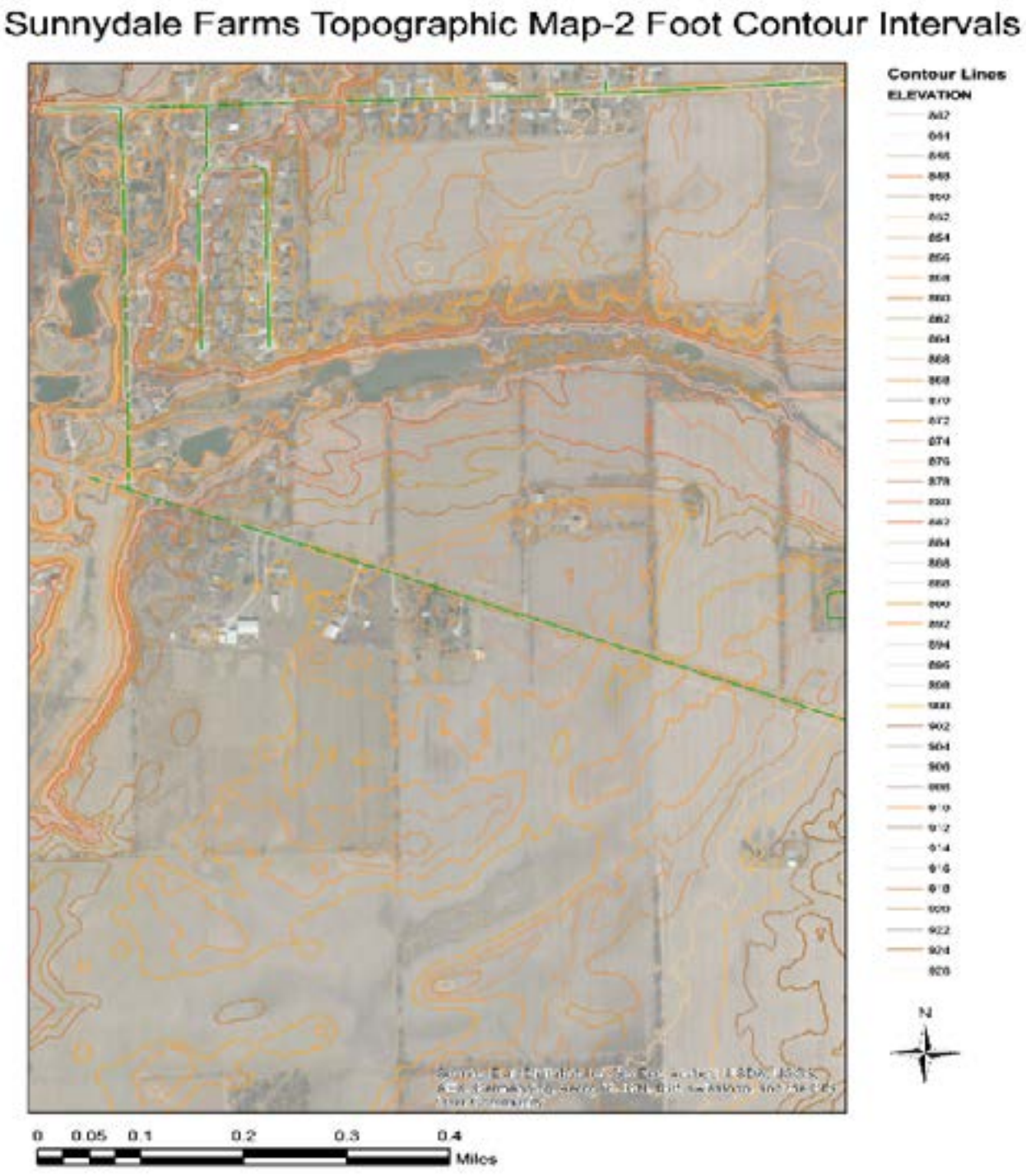


Figure 3-6 Topographic map showing 2 foot contour internals.

Figure 3-7 Images showing pond in center of site.

Figure 3-8 Image showing Spring Branch of Fall Creek or Keltner's Ditch.

sidewalks along either highway, the comprehensive plan for Pendleton projects extensions of sidewalks along S.R. 38.

Topography: The site generally slopes gradually toward the center of the property with a pond and streambed. Figure 3-6 shows a topographic map with 2 foot contour intervals graphically demonstrating elevation change on the property. . The pond is about 3 acres of open water, and surrounded by approximately 20 acres of secondary growth forest (see Figure 3-7). The Spring Branch of Fall Creek, meanders through the property for 1,000 feet and is shown in Figure 3-8. Several of the fields contain low spots and/or non-functioning field tile which ponds water in spring or during periods of especially heavy rain, The building program should use sloping areas of the property for build sites in order to:

1. remove these erosion prone areas from agricultural production, and
2. use natural topographic changes to reduce earth moving required for basement/foundation work.

FEMA Flood Zones: Much of the center portion of the property falls within the 100 year floodplain and therefore has limited development potential (see Figure 3-9). Fortunately, these areas are also the most attractive for conservation and would be dedicated toward greenspace in the form of an easement.

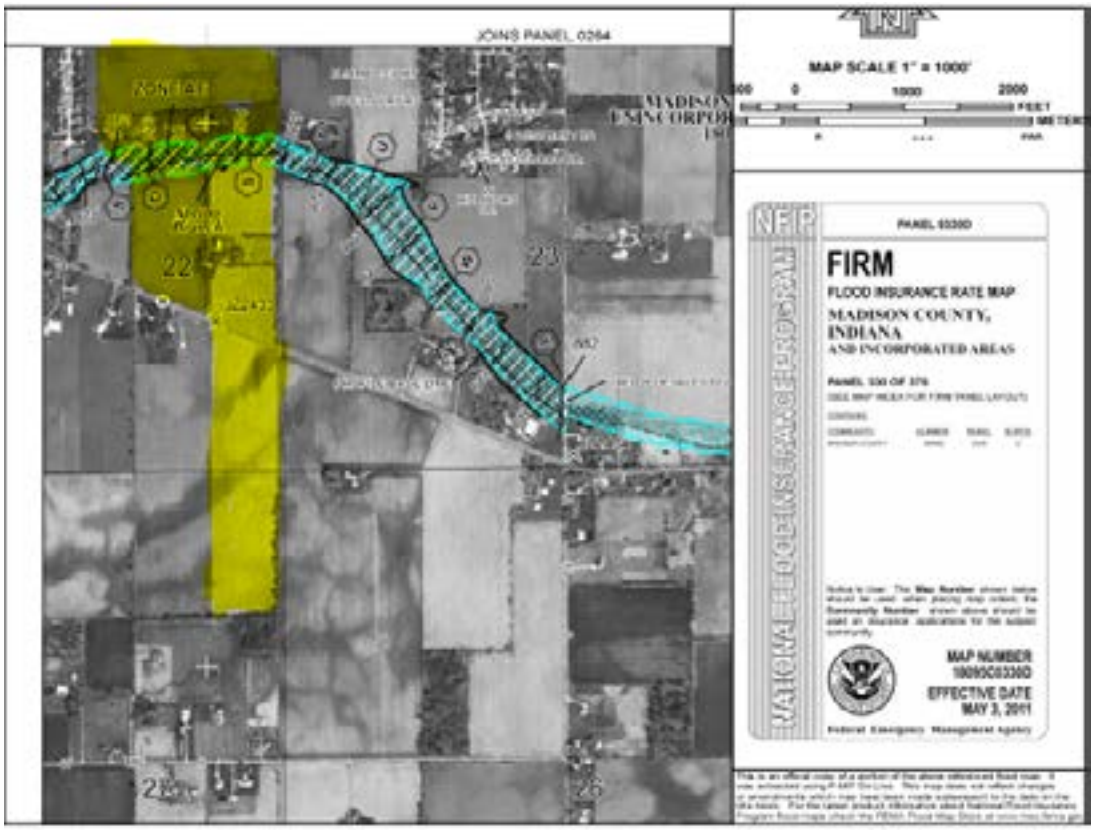


Figure 3-9 Flood map showing extent of 100 year flood plain. Site is highlighted in yellow.

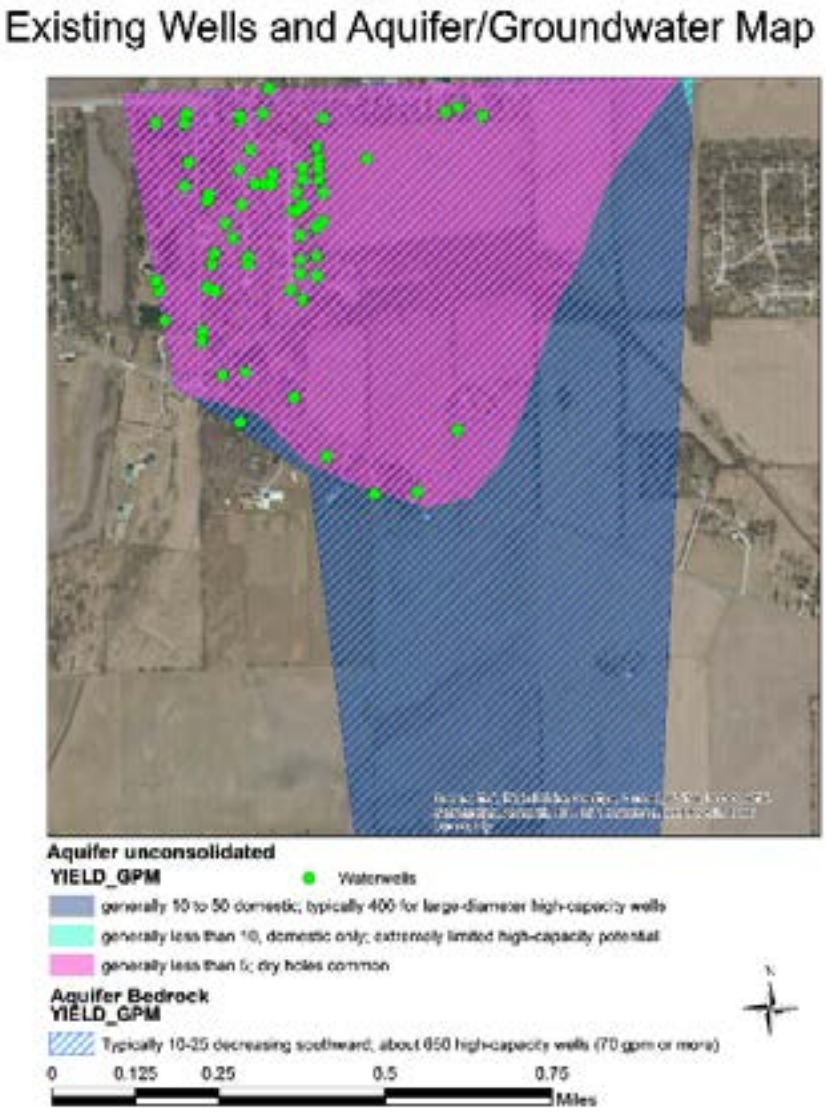


Figure 3-10 Wells and capacity of aquifer to supply water from deep wells.

Water Resources/Groundwater: Currently municipal water is not available on the site and therefore development would require the installation of private wells. Existing wells, unconsolidated aquifer, and bedrock aquifer yields are shown in Figure 3-10 . The northern two-thirds of the property have limited potential for groundwater collection from wells dug into unconsolidated aquifer; however deeper wells dug to the bedrock aquifer have potential to produce more than 70 gallons per minute, which would provide ample water for a development of this size.

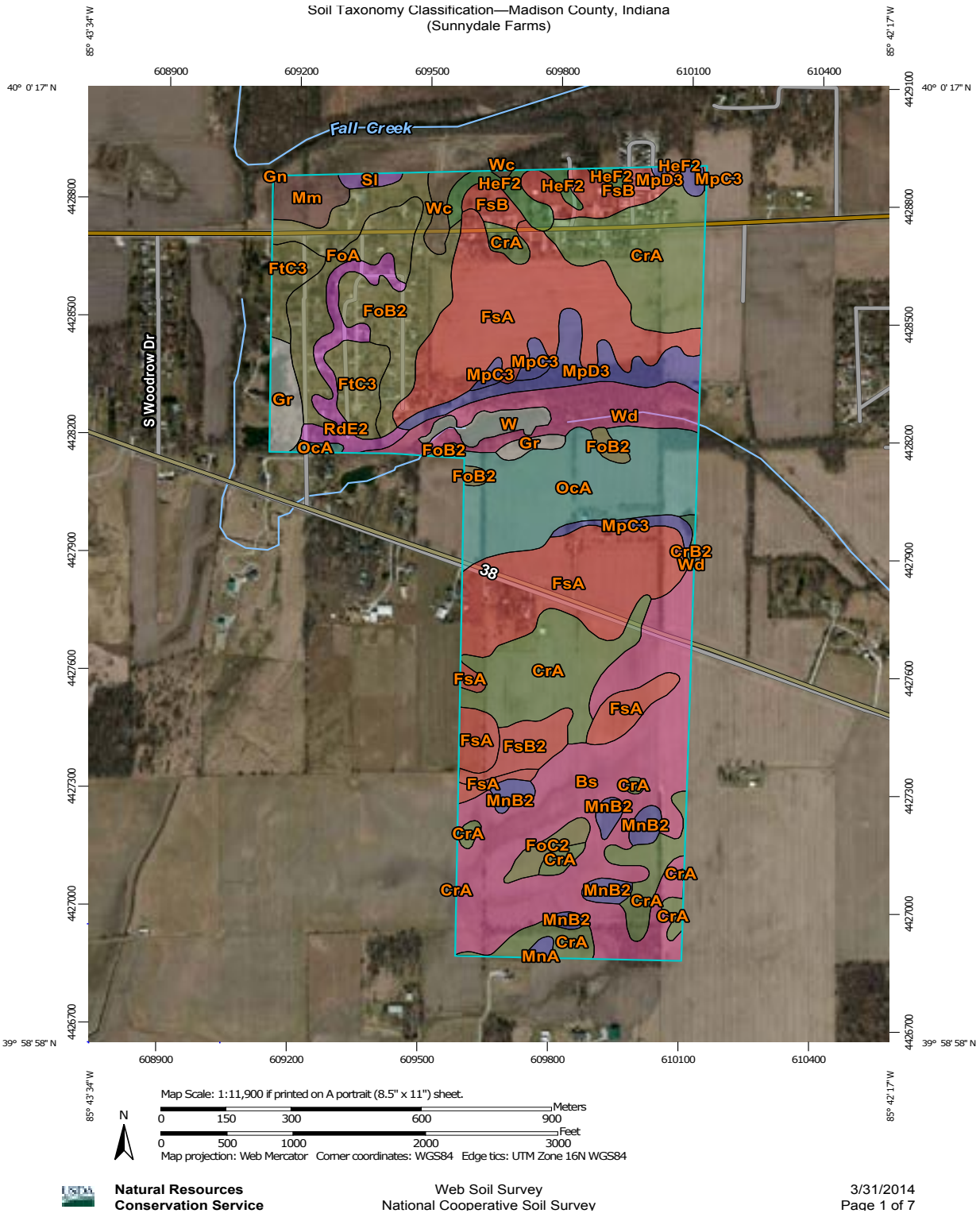


Figure 3-11 Soil Map showing soils found on site. Full description in Appendix.

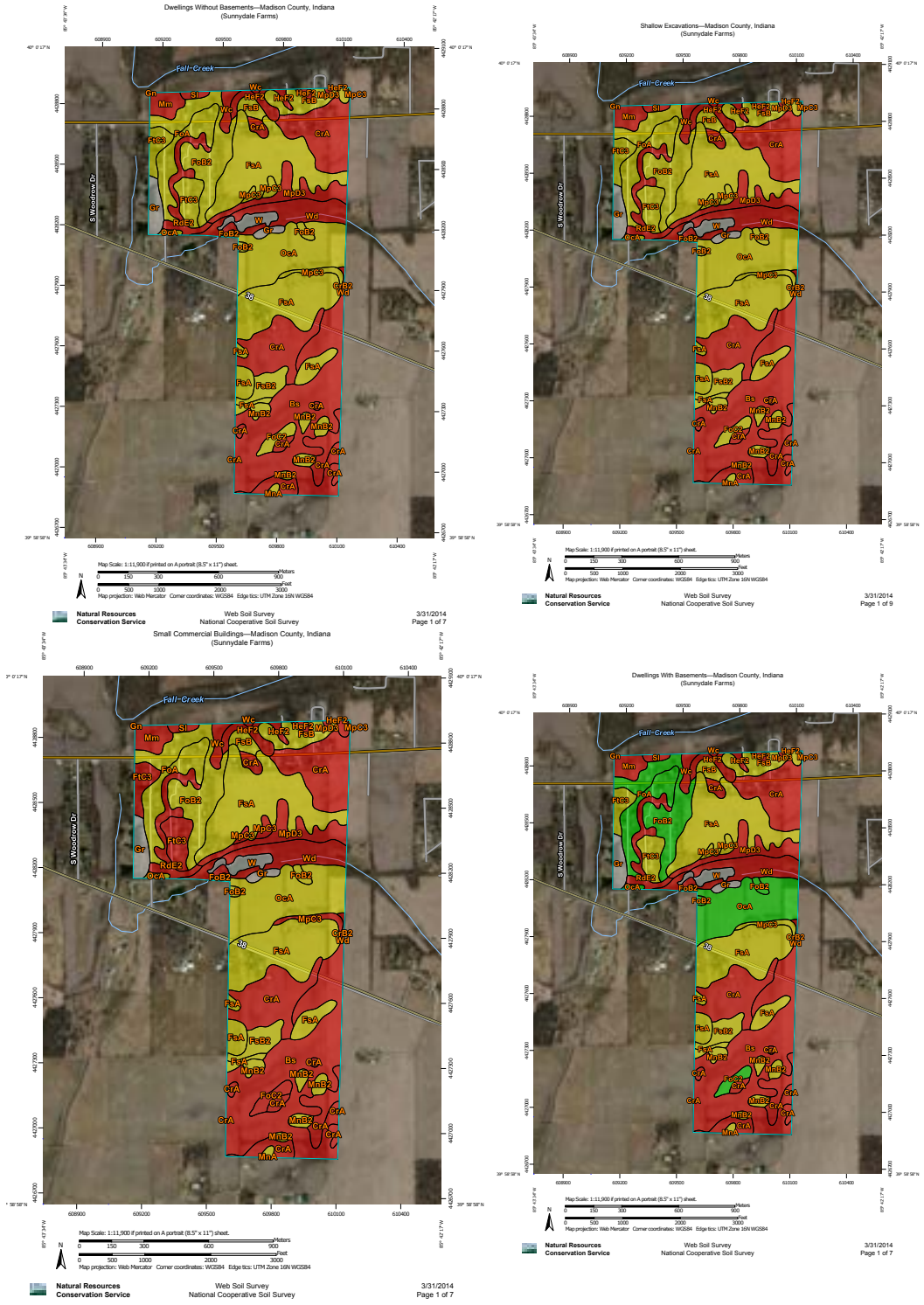
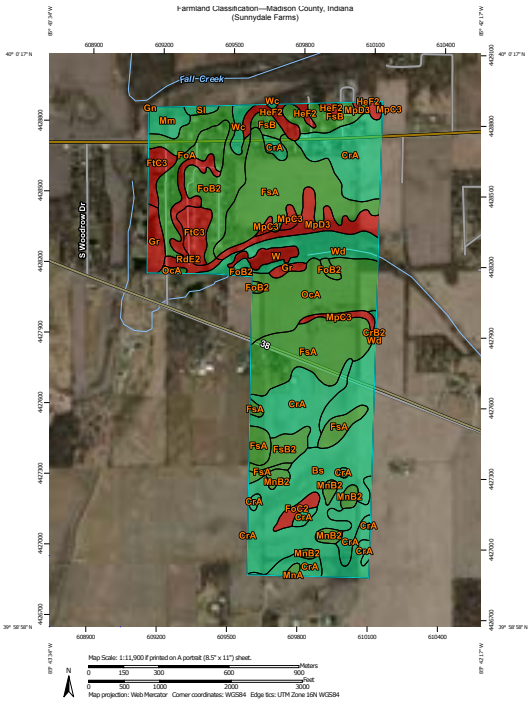


Figure 3-12 Soils maps showing building applications including: clockwise from top left, dwellings without basements, shallow excavations, small commercial buildings, dwellings with basements. Build sites take advantage of most conducive building conditions on-site. Single-family and cohousing developments occur in only area favorable to basements. Commercial development located due to soil type and proximity to highway.



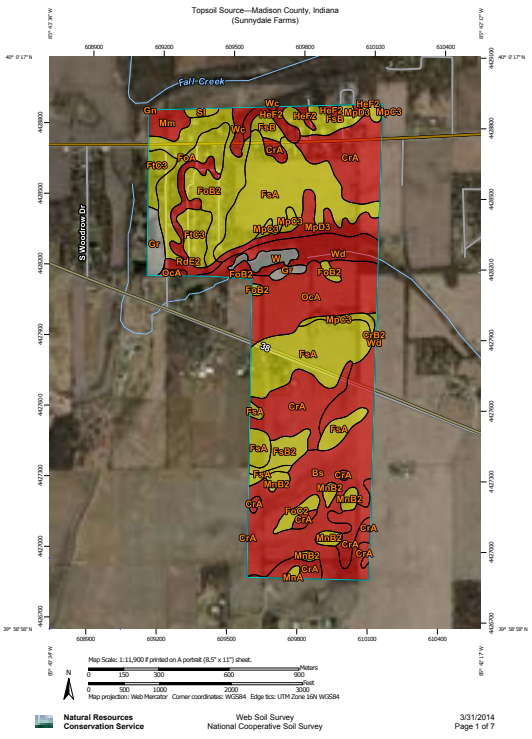


Figure 3-13 Soils maps showing Clockwise from top, Farmland Classification, Hydric Rating of Soil, and Topsoil sources. The most productive farmland is preserved in agricultural easement. Hydric soils, located primarily south of State Road 38 are not developed and retained for agriculture

Soil Analysis: Many of the soils on the site are not conducive to development due to physical characteristics. Most of the soils do not drain sufficiently for the installation of septic systems. Soils on proposed building site are Fox silt loam, Ockley silt loam, and Miami soils on 6-12 percent slopes. Sloping areas, concentrated around the existing farm are not developed. Due to evidence of erosion on these slopes, these areas will be transitioned out of row-crop production. The soils map lists a gravel source immediately south of the pond in area of proposed quarry. The excavation of the pond should yield building material including: topsoil, sand, and gravel. Soils maps and descriptions of applications are shown in Figures 3-11 through 3-14.

Demographic Analysis of Pendleton

In order to effectively market a housing development, it is important to understand the context of who lives nearby, what types of projects will be supported by the community and what will be opposed, and where the market for housing will come from. An analysis of the nearby population will provide insight as to the preferred housing product and inform the building program. Data was collected during the spring of 2014 using US Census data. This will include existing housing, what is being constructed (at the time of this study), and what will draw new home purchasers to the area.

Racial Profile:

Pendleton is a homogenous community with almost 95% of the population reporting as Caucasian and approximately 1% each reporting as either African American or Asian.. Latinos, a growing demographic in Central-Indiana, constitute 2% of the population. The racial breakdown of the community is demonstrated in Figure 3-14.

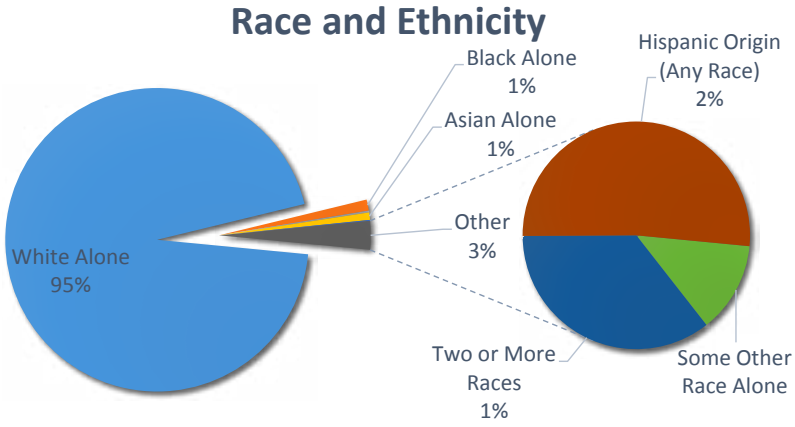


Figure 3-14
Pendleton
Racial Diversity.

Population Age:

Currently the age of the population in Pendleton is relatively evenly distributed with more than half the population occurring in the 25-64 year of age (Figure 3-15). Residents age 20-24 occupy one of the smallest age cohorts, with 4.3% of the population, which could be explained by residents leaving the area for higher education or to seek employment in larger cities. In order to effectively market the housing development, it is important to account for which age groups will be growing in the population. Figure 3-12 shows expected growth between 2012 and 2017 within a 30 mile radius. Growth is expected for residents 25-44 and those aged 55-74 (ESRI Business Analyst, 2014). These individuals constitute either first-time homebuyers or retirees/ empty nesters. Both groups are less likely to prefer larger homes with multiple bedrooms typical of conventional suburban development. Square footage is less likely to motivate these purchasers than price, careful design, or community amenities.

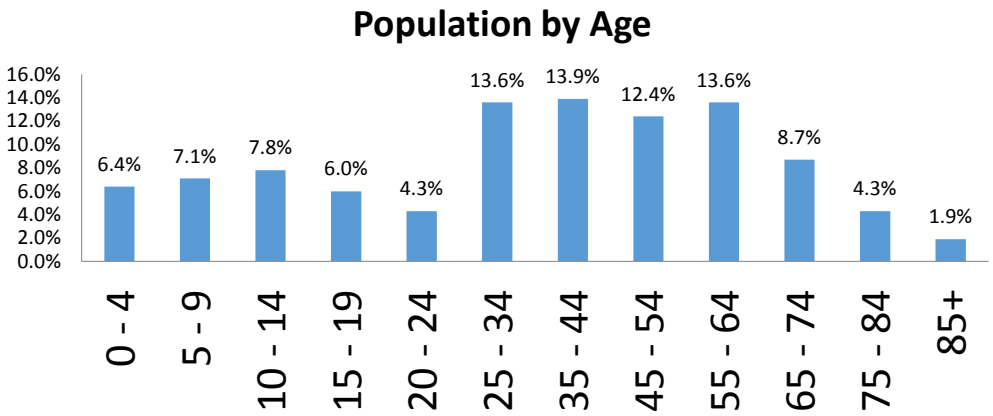


Figure 3-15 Pendleton Population Age Profile.

Household Income

Almost 50% of the town's households earn between $50 and 99 K annually (Figure 3-16). This is above the state average of $45,145 and shows that households in Pendleton have higher income than statewide averages. Pendleton residents earn more than other nearby communities including Anderson, Greenfield, and Noblesville (see Figure 3-25.)

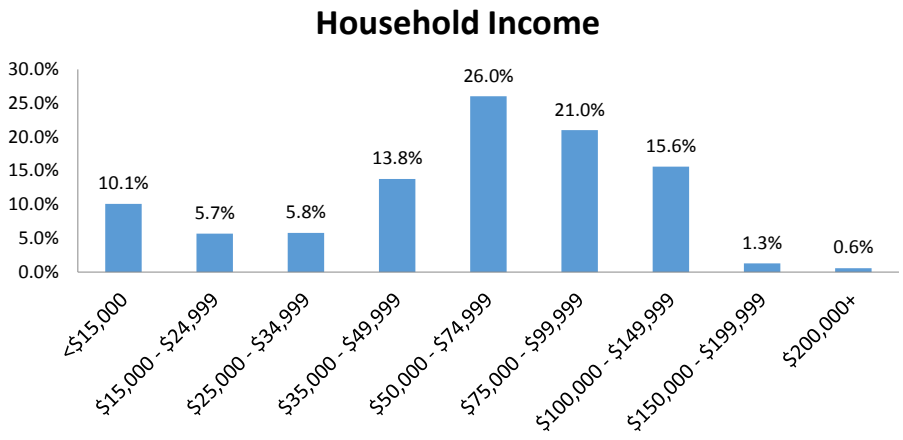


Figure 3-16 Pendleton Income Distribution.

ESRI Tapestry Segmentation

Homogenous also describes the types of people who live in Pendleton based upon lifestyle choices. Nearly 91% of the town falls within three of ESRI's demographic segments with almost half of them fitting into one profile group, "Cozy and Comfortable." (ESRI Business Analyst, 2014) Pendleton psychographic groups are typically married with school age children, conservative, and avid do-it-yourselfers. (ESRI Business Analyst, 2014.) The appendix contains descriptions of each segment type. The developer should account for conservative preferences in order to effectively market co-housing product. Emphasis should be placed upon convenience of lifestyle, independent lifestyle, and hardworking values in order to avoid preconceived ideas of cohousing.

Educational Attainment:

Figure 3-17 shows the educational attainment for Pendleton residents. The largest group of residents holds only a high school diploma, though some 22% of town residents have a Bachelor's or Masters Degree. Unfortunately, 12% of the population has not completed high school. Education levels correlate to income levels and residents with higher education can be expected to prefer more amenities both in their homes and in their neighborhoods.

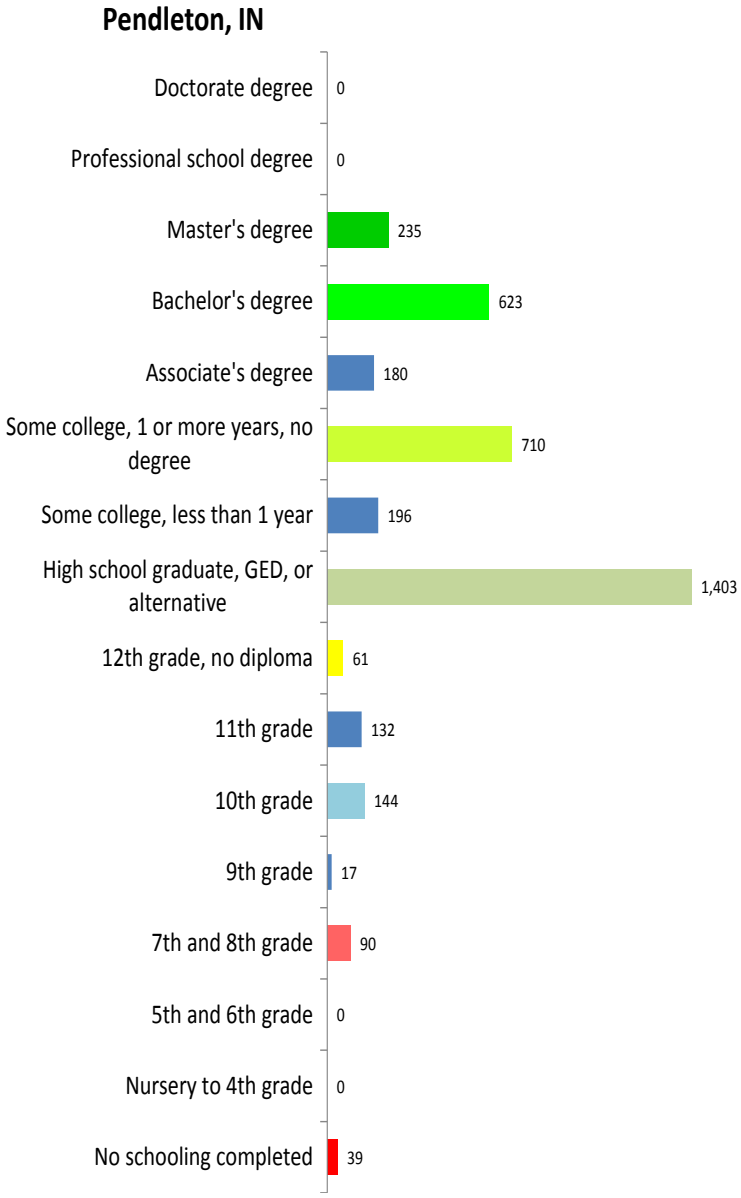


Figure 3-17 Pendleton educational attainment.

Housing by Value:

The median home value in Pendleton is $130,800 with average home values slightly higher at $149,056. More than 22% of the homes are valued $100-125,000 and almost 60% of the housing stock is between $100-200,000 (Figure 3-18). The price of existing home stock informs the competition in the market and provides an insight into pricing for new construction. With new features and amenities, new construction can demand a slightly higher price and therefore pricing new housing in the $150,000-250,000 range is a reasonable assumption for developers.

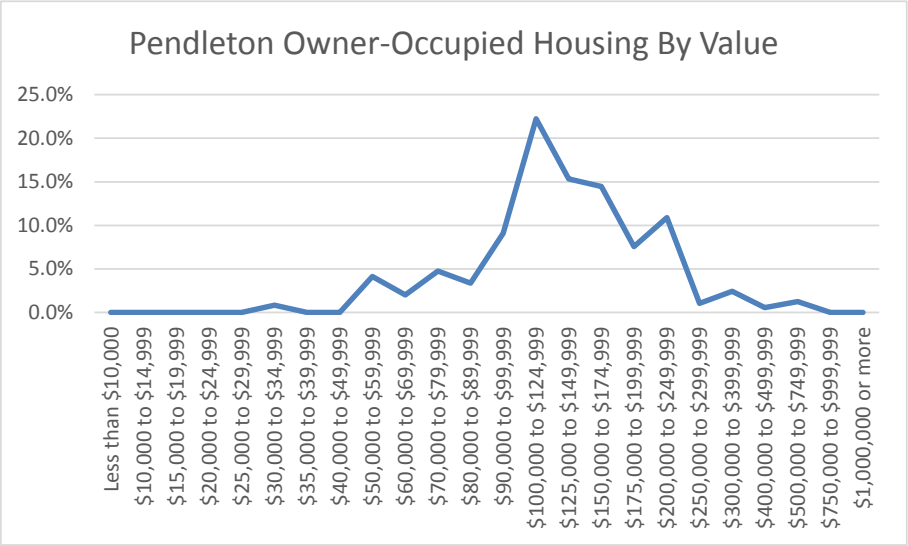


Figure 3-18 Pendleton Housing Value.

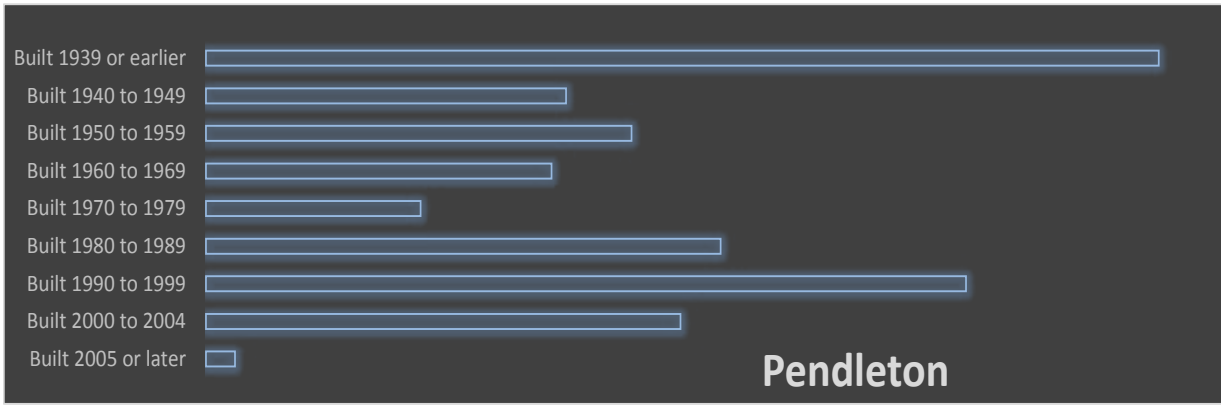
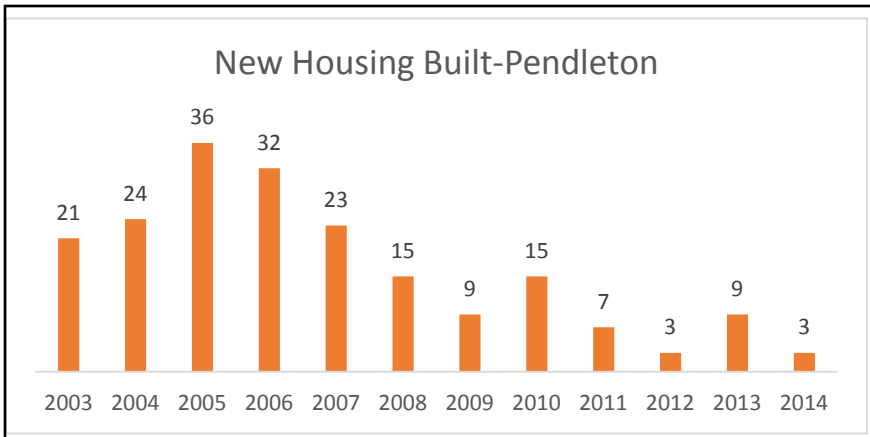
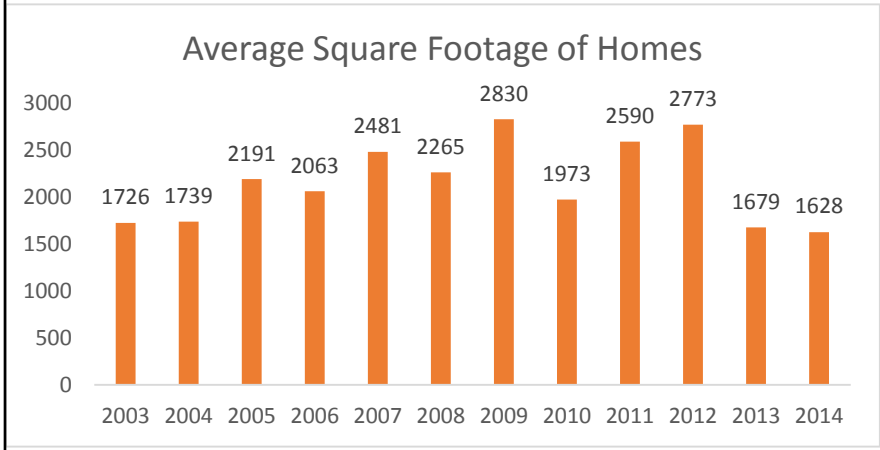


Figure 3-19 Age of Housing Stock





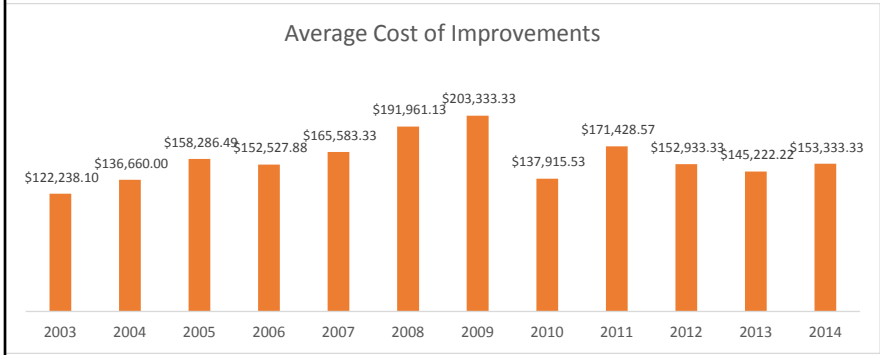


Figure 3-20 Pendleton Building Record 2003-2014.

Age of Housing Stock

Figure 3-19- shows that a large percentage of the homes in Pendleton (~25%) were constructed prior to World War II. It is also worth noting that almost no homes have been built in the town since 2005. Between 1990 and 1999 was the largest housing boom in the town with almost 20% of the housing stock built during this time.

Pendleton Building Permits:

Information obtained from Mike Guard, building inspector for Pendleton is summarized in Figure 3-20. Housing starts have declined from a high of 36 during 2005 to a low of 3 in 2012. Recently improvement in Pendleton's housing market has begun to show some turnaround, however new construction has yet to return to pre-recession numbers of 2006-2007. The ten year average of housing square footage was 2161 square feet and cost of improvements was $157,618. These numbers provide a baseline for the size and price point for new construction.

Figure 3-21 Extent of 30 mile radius around Pendleton.

Residential Market Area:

Using demographic projections from U.S. Census data, the population for Pendleton is stable and shows very little growth and therefore a marketing strategy for housing in Pendleton should draw upon a larger market area. A 30 mile radius was chosen for analysis and can be justified by the unique nature of the building program and because it is believed that this includes the farthest residents would be willing to commute. This market area includes Greenfield, IN Anderson, IN and Noblesville, IN which were used as comparison communities. Figure 3-22

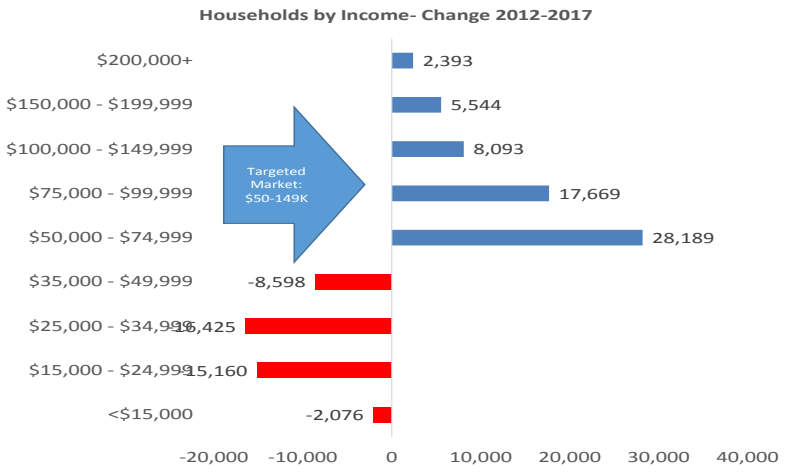


Figure 3-22 Change in Households expected 2012-2017 for 30 mile Radius around Pendleton.

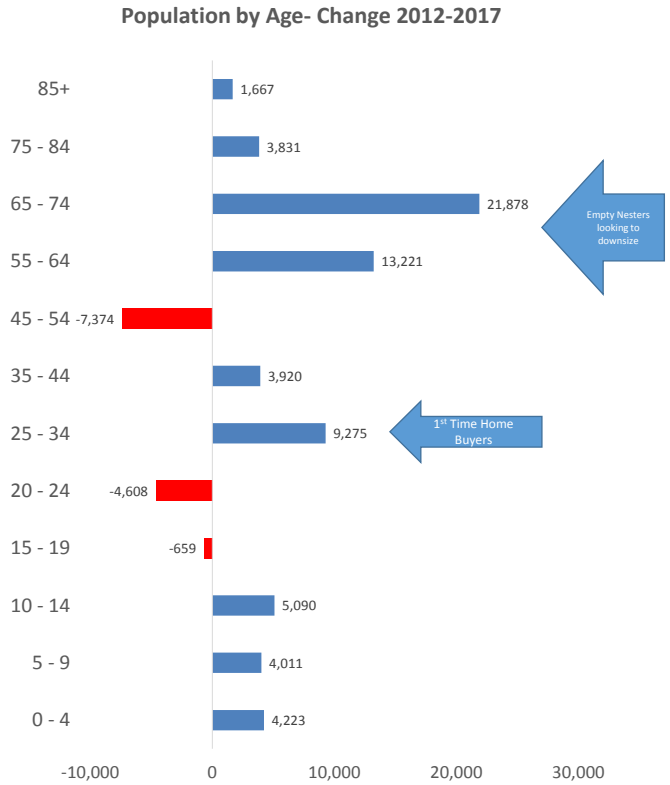


Figure 3-23 Expected change in population by income bracket.

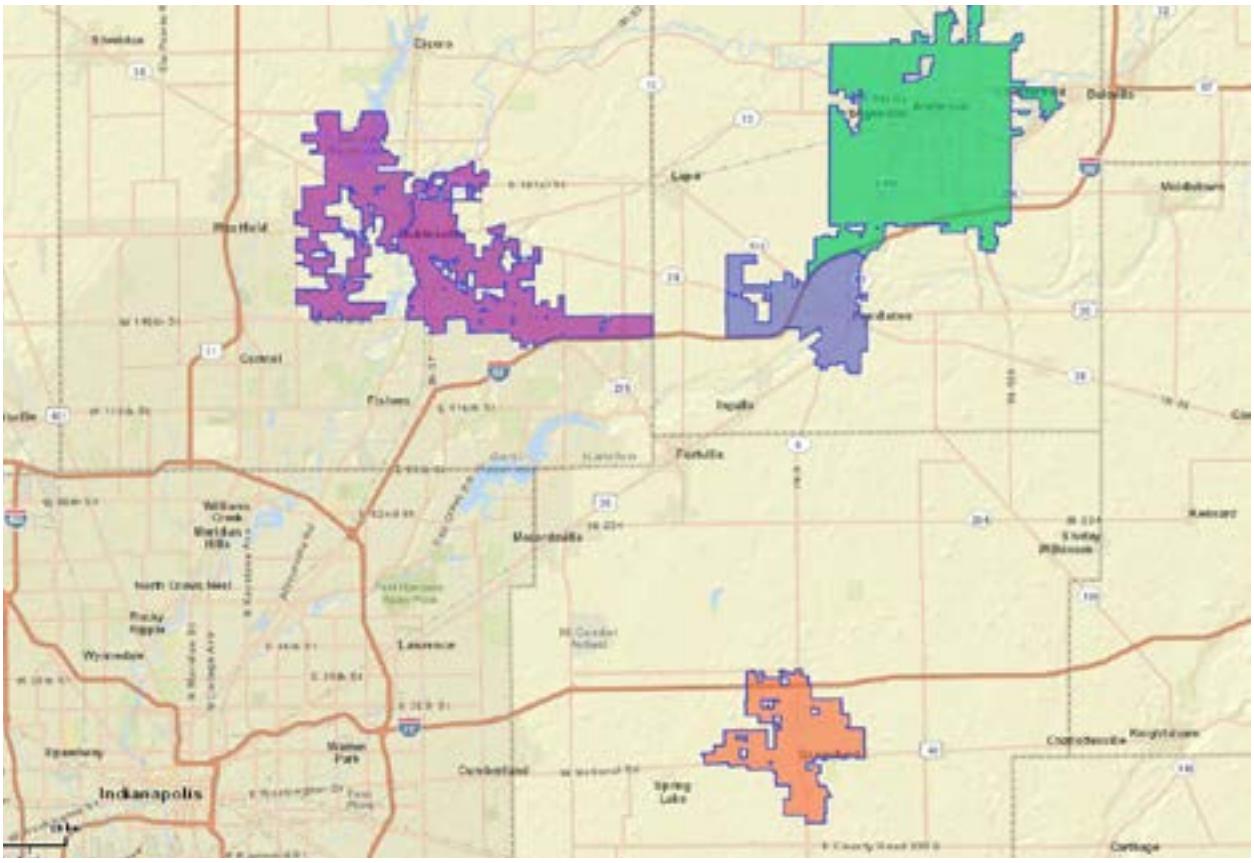


Figure 3-24 Map showing other communities in competitive market area.

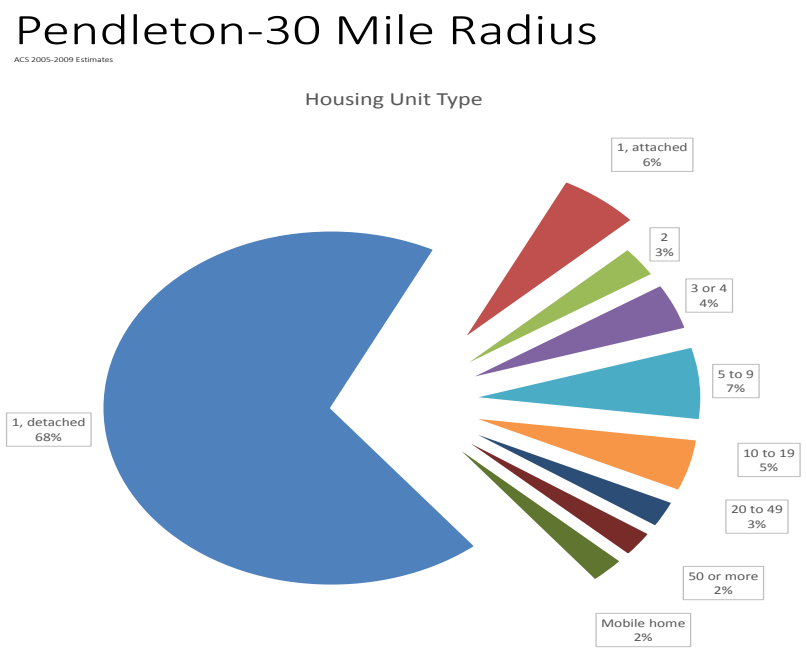


Figure 3-25 Housing Types within 30-mile radius of Pendleton.

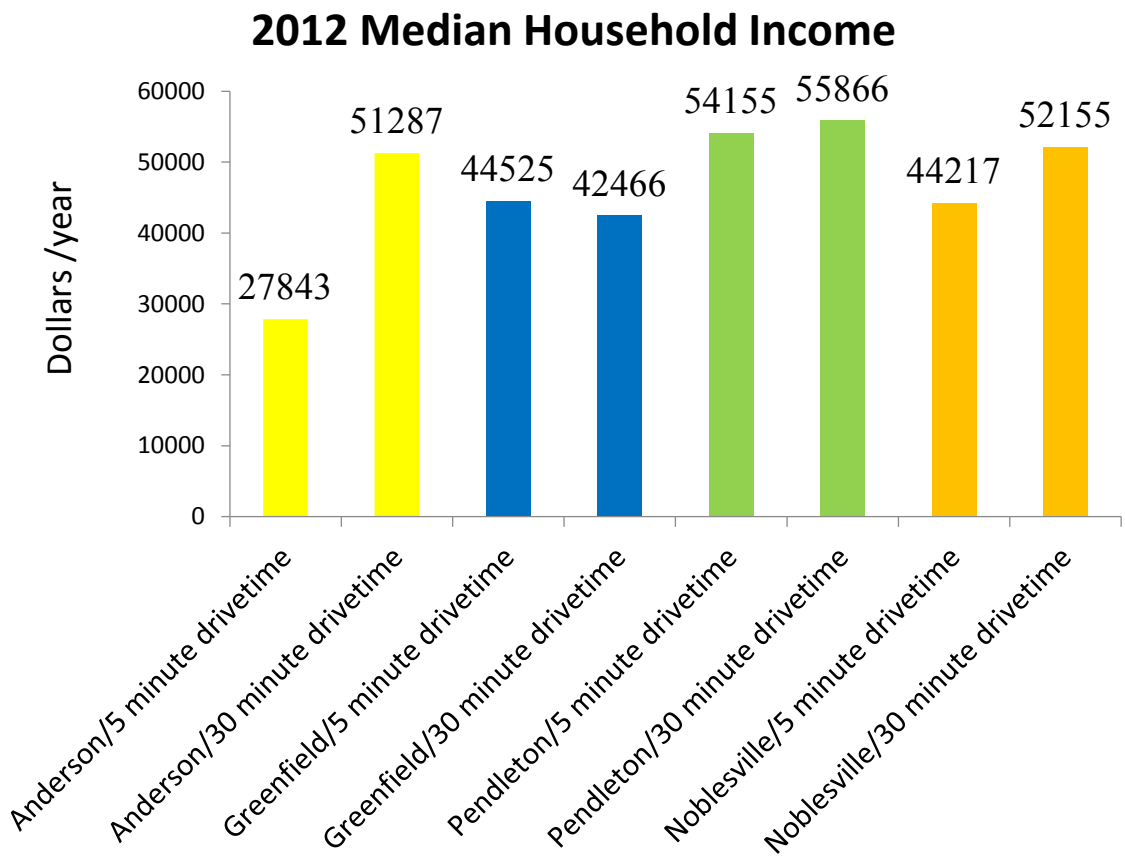
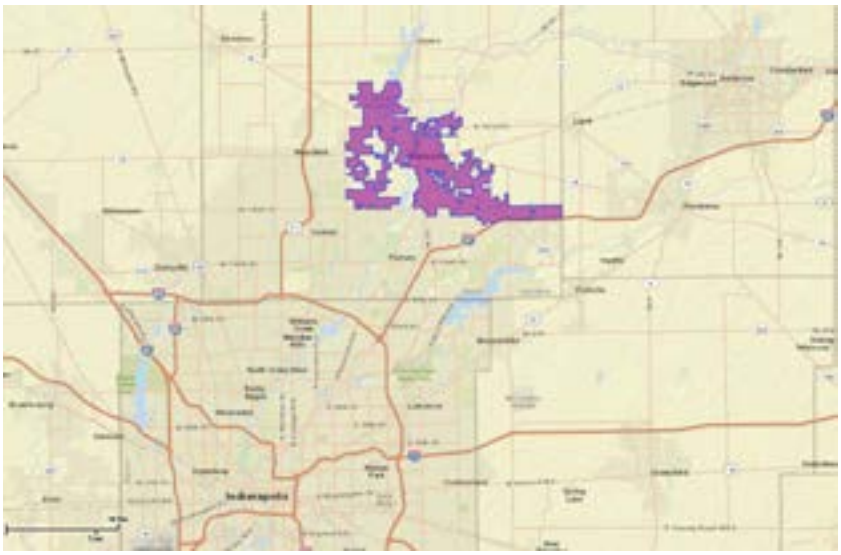


Figure 3-26 Median Household Income Comparison.

demonstrates that within a thirty mile area of Pendleton, higher income residents are expected to increase while lower income residents are expected to decrease. Future residents are more likely to prefer new housing stock and more likely to qualify for financing to purchase new housing. When the age of expected 2017 residents is analyzed, young middle aged persons and retirees are expected to increase while those aged 15-24 and 45-54 are expected to decrease, (Figure 3-23.) Individuals aged 25-44 and 55-74 are more likely to be home purchasers than other age groups. Marketing of development should target these groups. Figure 3-25 shows types of housing stock available in 30 mile radius. The majority of this housing is in single family housing (74%) with either attached or detached garages. Homes with attached garages constitute only 6% of housing, therefore product with attached garages should prove attractive to home purchasers.

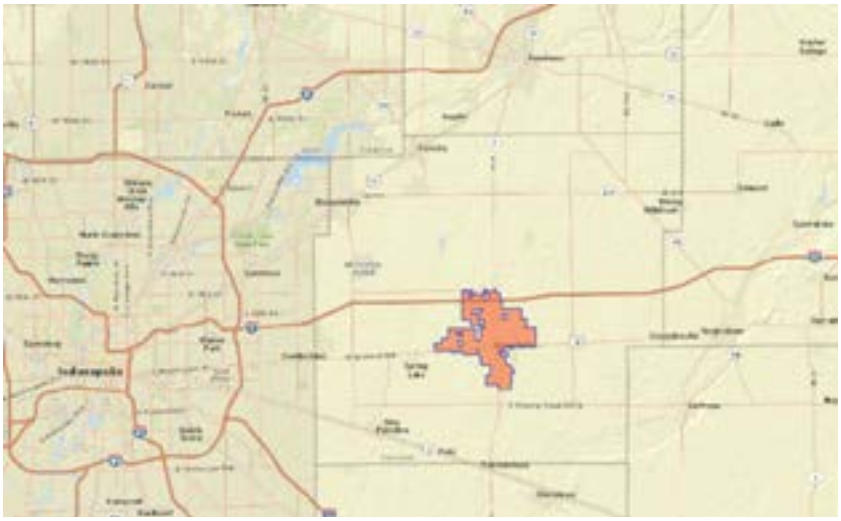
Comparison of Pendleton, IN Noblesville, IN Anderson, IN and Greenfield, IN

Proposed development will compete with other nearby cities and towns to attract home purchasers. Pendleton was compared with three other nearby communities. Figure 3-26 shows that Pendleton has the highest median household income of all 4 communities. Pendleton



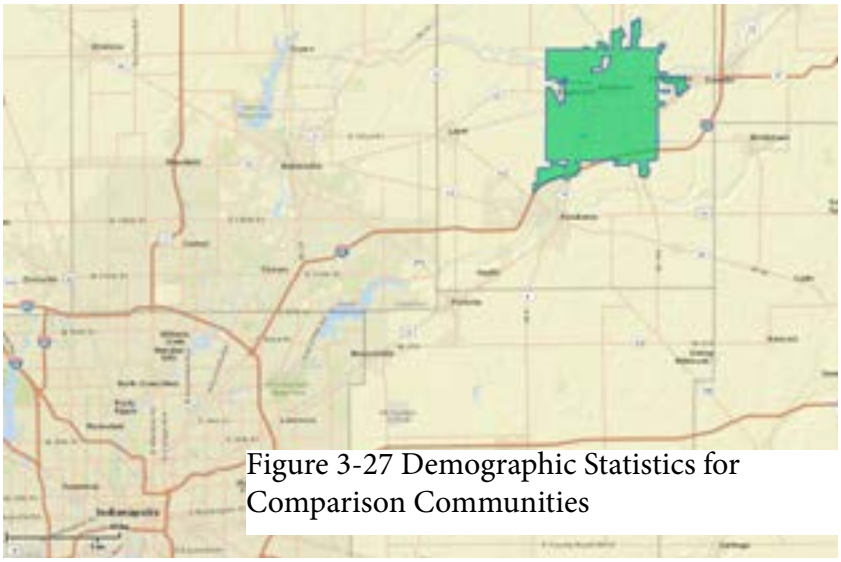
Noblesville, IN

13% of Population Non-White.
50.6% of Households earn between $50,ooo-149,999.
Almost 13% of households earn more than $150,000.
54.5% of Population between 25 and 64 years of age.
60.6% of Housing valued between $125-250 K
Only 14.4% of Owner-Occupied Housing with no Mortgage.
57.3 % of Housing built since 1990.



Greenfield, IN

93% of Population White.
55% of Households earn between $50,ooo-149,999.
51% of Population between 25 and 64 years of age.
44.5% of Housing valued between $90-125 K
12% of Owner-Occupied Housing with no Mortgage.
24.3 % of Housing built 1990-1999.



Anderson, IN

72% of Population White.
19.5% of Households earn less than $15,000.
48.8% of Population between 25 and 64 years of age.
Average Home Value $92K.
23% of Owner-Occupied Housing with no Mortgage.
25 % of Housing built prior to 1939.

Figure 3-27 Demographic Statistics for Comparison Communities

Figure 3-28 Comparison of Housing Values. Shaded bars represent target price for housing product.

residents are more likely to afford new housing. Statistics for comparison communities are shown in Figure 3-27. Comparison of housing values in the respective communities is shown in Figure 3-28, with prices of proposed housing highlighted on graph. Pendleton compares favorably to both Greenfield and Noblesville in the relative affordability of its housing stock.

Current For-Sale listings for Pendleton

Listings collected in during May, 2014 provide a sample of product currently available in the area. Figure 3-28 shows a development parcel, 1 mile west of the site that has seen a dramatic reduction in the listed price. Figure3-29 Shows lots available for ~$30,000 each, homes built on a lot for $140,000, or a home listed at $210,000. Available properties demonstrate competition in the market and expected prices for new lots and housing. Although not a comprehensive list, listings provide insight into current market conditions.

Figure 3-29 For Sale listing for development site 1 mile west of proposal. Note change in price from original listing of $20,402,076 to current list price $788,000 (May, 2014.)

Figure 3-30 For sale listings for lots and homes near proposed sites. Advertised prices were taken May, 2014.

Chapter 4-Building Program

The positive attributes of the site lie in the physical characteristics and its proximity to the town along arterial roadways. The rural character of the site is the very essence of its attraction and therefore should be maintained regardless of the development model. Yet, the proximity to the town and 24 hour amenities at the intersection of US 36/Hwy 9 provide the convenience of a more urban setting. In this way the site provides the possibility for country living with the conveniences of town. The site contains several different parcels accessed from two different roadways and several different ecosystem types. Development of the parcel is based on the access and characteristics of the site and therefore should be done in several phases. Phasing the project enables land values to increase commensurate with density increases and greater variety of use.

Some soils are more amenable to farming and should remain dedicated to that use. The access to the northernmost parcel is impossible without purchasing one or more of the lots along Hwy 36. The two right-of-ways on the northeast and northwest corners of the site do not provide sufficient width to enable the installation of roads into the interior of the lot. Without an access point from the northern portion of the site, a road from the south would be required. This road would cross both Keltner Ditch and hundred year flood plain and would add significant expense to the project. Installing a bridge would involve the US Army corps of engineers

The current zoning designation of Agriculture would not allow sufficient density of housing (only 60 total units on entire 138 acres) to still maintain the agricultural identity of the land while generating a profit (See Table 4-1.) Clustered housing will enable both a more intensive and higher value use of the land while retaining some agriculture on the site. The site shall be designated the site as a planned unit development (PUD) which would enable development in clustered nodes (with some density) while reserving other areas of the site for agriculture, habitat, and recreational use. Additionally, this would enable some areas of the site to be designated commercial which would provide an employment base for some residents as well as increase the density and variety of housing types. In order to do this a rezoning of the property

Figure 4-1 Site Plan of Proposed Project

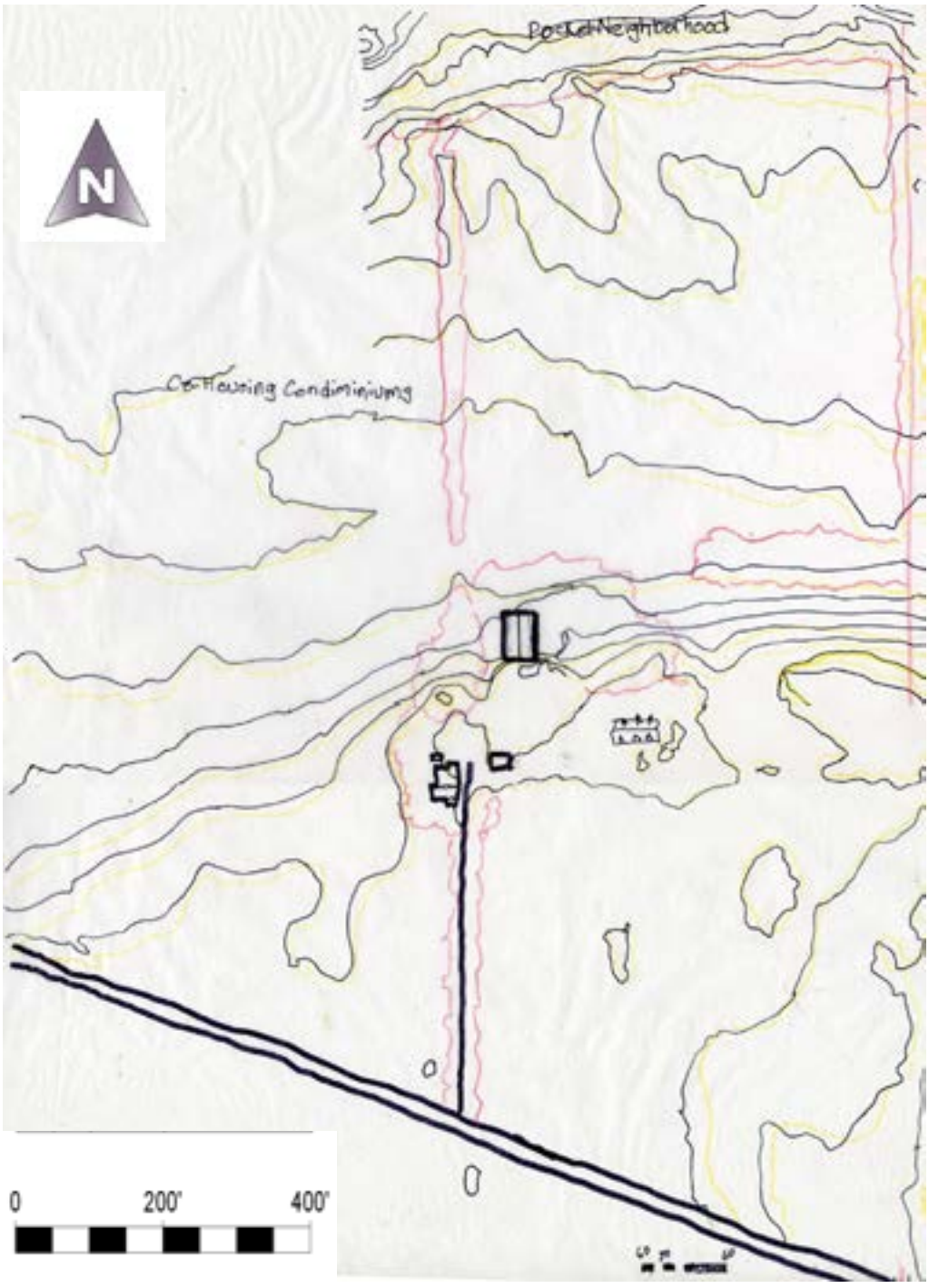


Figure 4-2 Topographic drawing of existing buildings and development parcels showing contour intervals of 2 feet.

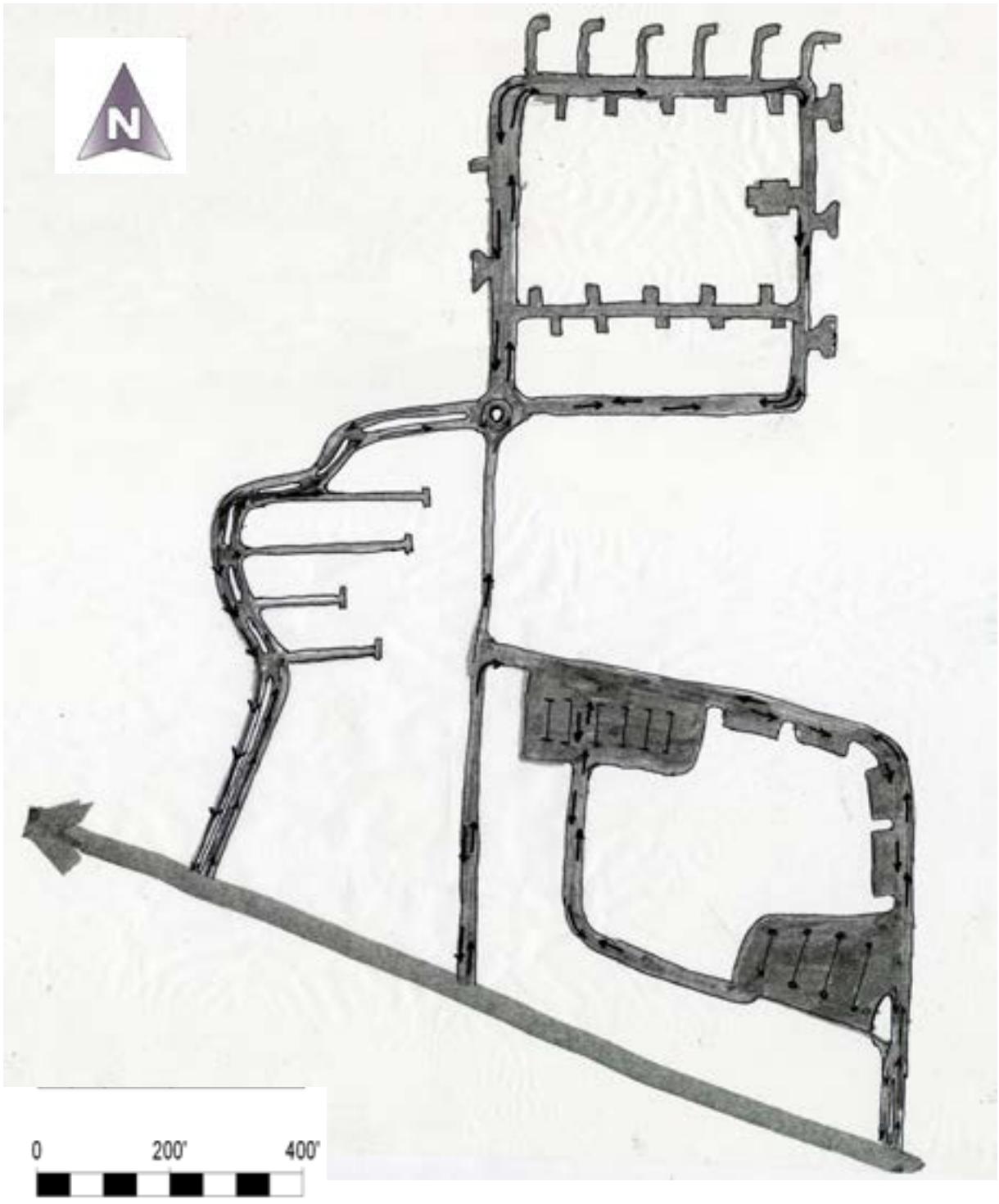


Figure 4-3 Circulation Plan of showing roads and parking areas.

Description	Phase Built	Year Initiated	Area-Acres	Uses/Density	Houses/Buildings	Special Considerations
Property Boundary	N/A	N/A	138	Currently used for conventional Row Cropped Corn and Soy with GMO Seed and chemical treatment for both insect and weed pests. Cash rent agreement with farmer provides significant income to owner and farmer alike.	N/A	Sewer Service along US 36 on north edge of property and along SR 38 to residences on southside of highway.. Access to northern parcel limited for development purposes. Stream and floodplain through property offer benefits and drawbacks.
Sunnydale Farm	1	2015	6	Restaurant, farm sales, farm operations, events, housing for owners/managers, community Center/Common House, Nursery for development, Agritourism, utilize existing buildings with addition of hoop houses and, shop/storage building A.)pool, B.)greenhouse, C.)extensive play ground	Apply for federal grants-conservation, historical preservation of Barn and Corn Crib, dedicate property as historic Family Farm. Addition of community amenities. (POOL, greenhouse, etc.) as development progresses.	Requires significant investment. Creates primary marketing tool/attraction for development. Requires complex business structure including both for-profit and non-profit components. Significant operational expenses come from insuring agri-tourism operation against liability.
Nature Preserve, Trails, Pond, Wetlands Mitigation, Park/Athletic Space, Agricultural Easement	1 preserve (with homesites dedicated in PUD), homes built in Phase 3	2015	60	3-4 Luxury lot size homes valued at $500,000. Trails and preserve in streambed, woods	Conservation grants to fund community resources, wildlife conservation, 4-5 large lot homes on periphery. Opportunity to expand wetlands as mitigation effort (potential revenue source).	Remediation of pond necessary to create high quality asset, currently largely a liability. Remediation offers opportunity to extract aggregate materials for onsite consruction.
Renard's Run Pocket Neighborhood	2	2020	17	Conservation Subdivision designed based upon pocket neighborhood design principles. 3-4 DUA	30 single family homes.	Amenities come online as development progresses (assuage concerns of purchasers by creating bond fund that finances building). Opportunity to partner with Habitat for Humanity to build a number of affordable houses.
Sunnydale Farms Cohousing Community	1	2016	10	Worker owned conservation subdivision, 3-5 DUA	36 total units, 4 unit blocks built in increments of 8 at a time	Variance needed to obtain density, however should be justified through the dedication of easements elsewhere on the property. By forming co-housing group, units can be pre-sold prior to construction. Reduces developers carrying interest by quickly transferring title to purchasor upon reciept of certificate of occupancy.
Sunnydale Plaza	3	2025-2030	9	Mixed use, ground floor commercial/retail/ tied to farm or expansion of farm operations/ second and third floor apartments, or condos. Some dedicated to affordable levels of income	10-30, Depending on Demand	Requires hook-up to Wastewater Treatment facility and possibly municipal water. Could include a Low-Income portion to subsidize building. Parking is designed to be shared among the various uses, including overflow parking for farm, employees and patrons of commercial area, and residents of apartments.
Pocket Neighborhood # 2, Accessed off Highway 36	4	2030	36	Conservation Subdivision designed based upon pocket neighborhood design principles. 3-4 DUA	30-40 Cottage Homes and 4-5 luxury homes.	Likely to require both ingress and egress point on US 36 for development. Lots along 36 will need to be purchased to gain access to the site. Wastewater located on site and more likely to receive municipal water from Pendleton.
Quarry/Wastewater Treatment Facility/District Utilities	1 and 2	Spring 2015	up to 10 within Cohousing, pocket neighborhood, and pond	Initially the use will be industrial as exotic species are removed, pond is dredged, material is dewatered, and aggregate is graded. Installation of wastewater treatment greenhouse and geothermal plant occurs when construction of Co-housing units commence. Additional facilities are added for pocket neighborhood.	3 Greenhouses, Heating/Cooling Plant	Wastewater treatment onsite will require plan commission approval. In order to be successful, requires technical expertise and demonstration of efficacy. Clustered housing reduces costs of utilities runs over conventional platting of parcel. Uses site topography and natural water course to deliver water and treat sewage generated on-site.

Table 4-2 Description of parcels and phasing of project.

by the Madison County Planning Commission would enable the project to begin seeking financing. Approval from the Planning Commission would be necessary for many aspects of the project. From Narrow roads, on-site wastewater treatment, farming mixed with residential, and increasing the density in the pockets of development, permitting and approval will need to come from local and county government. A variance would be required for enable water services to be

Calculations of Development Yield				
Essential Calculations				
Factors	**AC**	**S.F.**	**DU**	**FA**
Gross	138.00	6,011,280		
LESS Carve Outs	-6.00	(261,360)		
LESS Environmental	-24.00	(1,045,440)		
EQUALS Net Buidable	108.00	4,704,480		
LESS ROW	-34.44	(1,500,000)		
LESS OS	-13.80	(601,128)		
EQUALS Buildable Lots	59.76	2,603,352		
Development Yield				
Max Units based on Bldg Footprint & Height [zoning envelope]				**2,733,520**
Max Units based on Density			**138**	**1,041,341**
Max Units based on Lot Size			**60**	
Input Data Below in Boxes Only				
Site Characteristics:	**Acres**			
Gross Size of Site	138.00			
Carve Outs	6.00			
Environmentally Sensitive	24.00			
Zoning STDs:	**Units/AC**	**S.F.**	**Width or Ht. In L.F.**	**% of Site or Lot**
ROW			60	
Road			35	
Min Lot Frontage			100	
OS [Open Space]				10.0%
Min Lot Size		43,560		
Bldg or Zoning Envelope or Max Impervious Surface				30.0%
Max Height [see notes]			35	
FAR [see notes]	0.40			
Max Density in DU/AC	1.00			
Estimates as to Infrastructure		**S.F.**	**Length L.F.**	
Road or Curb or Sidewalk			25,000	
Size of ROW		1,500,000		
Acre =		43,560		

Table 4-1 Yield analysis under current zoning designation.

provided by a well or water would have to be delivered to the site. Deep wells on the site can be expected to yield 70 gallons/minute.

The first phase of development occurs over 10 years in order to absorb demand expected based on building data from Pendleton building department records (Guard, 2014). This also limits investment to when it is needed and the surrounding area to transition to more residential uses. Although municipal sewer services are available at the southwest corner of the property, the commercial phase requires water and sewer services onsite. An alternative to connecting to municipal wastewater treatment is to implement a solar aquatic treatment facility or other on-site water treatment facility. The phasing of the project is also a necessary element to generating sufficient buzz around the project and to develop the market that will then create demand for single family housing as it is built. The phasing plan is shown in Table 4-2.

Community Features and Timeline

Sunnydale Farms, as this project shall be called, begins by creating a destination farm and event center that becomes the centerpiece of the development. This provides the primary marketing tool and cultural draw for the project. Agri-tourism experiences offered on the site capitalize upon the agricultural heritage of the Pendleton/Madison County area and a burgeoning interest in local foods. By creating a destination for the community that supplies both a fundamental need and benefits from interest in farm production, a synergistic relationship is created where each aspect of the enterprise benefits the others. This grass-root marketing strategy will bring customers to the property and introduce them to the products without a need for overt marketing. When they come to buy carrots and lettuce greens they might notice the housing being built and investigate what the community is all about. If they come to a wedding at the corn crib, maybe they will ask about the neighborhood being built in the back. Site plans for project are shown in Figures 4-1 through 4-3 and were drawn at a scale of 1=100'-0.

The proposed project also begins with the core element of a working farm. Employment opportunities grow from this origin as more support services for the development and region are built into the project. This is only made possible as the population density grows on-site. Each additional component to the development supports and makes possible later ventures. The farm is connected with the co-housing group formed initially for the condominium units. The

management company formed in order to provide services (grounds keeping) for the site operates using funding from condominium fees.

Phase one of the project dedicates 6 acres in the center of the property, including all historic and existing buildings, toward the establishment of a small scale, high production organic farm producing high value crops as well as a variety livestock. In order to leverage grants and donations from both corporate and government sources, the business will be organized as a non-profit educational entity.

Simultaneously, the most environmentally sensitive, unique, and attractive portions of the property which include floodplain, pond, stream, riparian wood, and wooded hillsides are set aside for perpetuity in an easement to be managed by an independent land trust in cooperation with the Farm management and homeowners association (HOA) or co-housing governing body. By defining and protecting the natural character of the most attractive portions of the property, all lot purchasers are guaranteed that these resources will remain shared resources for the community and will not developed at a later stage of the project.

Employment on the farm begins with individuals focused on vegetable and animal production, onsite and farmers market sales as well as community supported agriculture (CSA) operation, and renovation of existing facilities and capital improvements to further production capacity. Installation of high tunnel greenhouses, pasture and housing facilities for livestock, processing and storage facilities for both produce and livestock are all necessary infrastructure improvements that will allow the farm to improve efficiency and add additional employees. Production increases will enable the hiring of additional employees until a total of 5 persons are employed, at least part time, working at farm operations. Once farm revenues reach self-sufficiency and production levels enable a surplus of farm products, the second nexus of employment on site will commence. The existing house will be converted into a restaurant serving breakfast and lunches as well as catering special events on the property. Employees to operate this second venture will number between 3 and 5 depending upon season and demand.

The existing dairy barn is envisioned as playing a multi-faceted and central role in the development. The existing structure is currently obsolete for a large agricultural operation. Re-purposing the building to serve both the farm and cohousing enable continued use of the structure. As the development progresses through stages, the function of the building will change to accommodate different needs. Initially, when the focus is on creating a viable farm, the role of the building will serve the day to day needs of the farm. This includes housing animals on the ground floor, tool and workspace on the main floor, and hay storage in the loft space of the building. Increases in revenue and renovation of the corn crib facility will shift some of these activities out of the dairy barn and enable its usage for more human centered activities. The open design of the building will facilitate the next building usage, serving as common house for the cohousing community. Functions will include community meetings and shared meals.

Prior to construction of the first phase of residential lots, the farm business will expand to include a nursery and landscaping business. Plant stocks will be dedicated to supplying new residences as well as common areas with native species adapted to the local climate. With sufficient lead time on construction, supply of nursery material can be matched to demand necessitated by construction. As with aforementioned sections of the business, employment will grow with demand. The business will evolve and grow from supplying new construction to maintaining common areas as well as private residences. A low-maintenance lifestyle provided by onsite management will be one aspect of the marketing of the development. Convenience and savings in both time and money from not owning a variety of lawn tools and equipment or spending time maintaining large areas of lawn should be attractive to tenants. If you want to garden, the tools are available in the tool room of the common house. This landscaping company, a subsidiary of the farm will employ between 5 and 10 people depending upon the stage of development.

While the expanding business of the farm will create a variety of direct employment, it will also generate indirect employment as the population in the area grows. Although the numbers

of individuals added by the development are not enormous (~200), local businesses and services such as hairdressers, CPA's, and restauranteurs will benefit from the added population. Falling somewhere between direct and indirect employment, tradespersons engaged in the construction industry shall be employed building the housing for the development. The co-housing units should be affordable to individuals building the units or working at the farm. Because these contractors will be sourced from local businesses, the residual effect of salaries will be a boon to the local economy and will keep moneys circulating in the local economy.

Ebenezer Howard recognized that no project would be constructed, regardless of merit or good intentions, without justifying to financiers that it generated profit. Developing Sunnydale Farms will require comparable justification in order to convince lenders that they will see a return on their investment. The site analysis demonstrated the level of demand for housing in Pendleton, where construction should occur, and defined the density of the proposed development, the building program defined what types of units would go where. Careful structure of the business entity will increase the likelihood of succes.

Business Structure:

The complexity of the project, including: conservation easement, educational functioning, multi-family housing, cohousing structured as condominium, and working farm, no one entity shall be created that oversees all aspects of the project. The lands held within the conservation easement will be managed by a non-profit created when the land is dedicated. Governance shall be formed from a board elected from property owners within community and director of the non-profit. Restrictions implemented at dedication shall guarantee the dedicated land is preserved in perpetuity. It is important that home purchasers are confident that commonly held property shall remain undeveloped as a shared resource. Any deed restrictions shall be structured to ensure this based upon the final site plan submitted as planned unit development. Other portions of the development will be operated as for-profit entities, including portions of Sunnydale Farms, areas under cultivation under contract, the condominiums, single family housing,

multi-family and commercial developments. Land held in agricultural easements shall be operated by a partnership between the farmer working the land and the homeowners association created at each phase of the project. Income generated from some farm proceeds will help to defray the costs of homeowner's association fees. The centerpiece of the project, the working farm and restaurant/event center will be divided with the majority of the business operations under the auspices of a Limited Liability Corporation (LLC) while the community outreach and educational components will operate as a 501 c3. Although structuring the business in this way adds complexity to the overall project, the result will provide tax advantages and increase eligibility for grants and awards.

Agreement of Sale

Acquisition of the site for development should occur as a Joint Venture agreement (JV) between the present owners and the developer, Sunnydale Farms. The rational for structuring the agreement this way is based upon the benefits that will accrue to both parties. If the land owners were unwilling to structure the agreement of sale as a Joint Venture, an option to purchase, conditional upon title, rezoning, and financing of the project valued at 5% of the total purchase price could be offered ($50,000). However, this would be mutually disadvantageous and would likely slow the process. Using a JV the owners will benefit from a source of revenue throughout the development process as a portion of each lot is earmarked for them. Additionally, the process of development will result in a gradual increase in the value of the entire parcel, so that the last lots developed will be worth significantly more than the first lots that are built. Finally, the owners will retain revenues from the cash-rent agreement with R and L Farms (existing LLC farming the property) for any portions of the property which continue to be dedicated to agricultural production. This could also include all portions of the development designed as conservation subdivisions with agricultural easements until that phase of the project is completed, see Table 4-1. A portion of each lot will be dedicated as easement for farming with the revenues dedicated toward reducing the HOA obligation of the lot owner. The developer will benefit by not having to finance

the purchase price of the land for the entire building process (a period which is likely to take years, depending upon demand). The property owners will benefit from an appreciation of the value of the land from agricultural land (currently approximately $6,000/acre) to residential and commercial land (nearby commercial parcels are valued at between $30,000-40,000/acre). Costs associated with the transfer of title will be limited to a transaction between the original owners and the individual purchasers of each lot (rather than transferring to the developer, then end user). Over the course of the project, this will result in savings to the current owners, the developer, and the end users.

The initial agreement will be structured to transfer site control in phases from the owners to the developer. As each phase is completed, control for the next phase will transfer between the owners and the developer, however revenues from farming of undeveloped parcels will be retained by the current owners. The first step to development requires that a title search demonstrating that no liens against the owners exist and that the title history is clean. Second, the site plan must be approved and the site be rezoned as a Planned Unit Development by the Madison County Planning Commission. Lastly, sufficient financing to begin phase 1 must be negotiated with investors. The JV agreement should prove attractive to potential investors as the subordination of this debt between the partners decreases the overall liability of the developer.

Building Assumptions

The current zoning of the property as an Agricultural District limits the lot sizes to a minimum of 1 acres, which would yield only 60 developable lots (See yield analysis, Table 4-1). Assuming an average value of $300,000.00 per residence, this nets a total of $12 million in sales. An increase in density of housing that yields 120 housing units on the property, with an average lot size of approximately 1/2 acre and with a reduced average sales price of $150,000 per unit would net a total of $18 million in revenue. If, as a result of development in the surrounding area as well as on the site, commercial properties and multi-family housing (mixed-use) became a part of the project the revenues would increase exponentially. The mixed use parcel (phase 2) could be post-

poned until after the phase 3 parcel is built out in order to allow the market to develop where a mixed use development is more commercially viable. In order to gain access to the northernmost parcel (phase 4), one of the lots fronting Highway 36 will need to be acquired in order to enable a roadway into the subdivision. Based upon the home values listed on Homes.com (May 2014), these lots range in value from $94 K to $129 K, however the westernmost lot would provide the best access point due to its lying contiguous to the existing right of way. This lot is also attractive because it is a double lot and provides 200 feet of frontage on Hwy 36, with an estimated value of $114 K it falls in the mid-range of all listings.

Using data obtained from the Pendleton building inspector, Mike Guard, for building permits issued from 2003-2014, average cost per square foot was $72.92/ SF (Guard, 2014). Using this number as a baseline, adjustments to account for basements, higher quality finishes, and infrastructure installation; estimates of $80/SF were assumed for condominium units and $90.00/ SF were used for single-family residents. In both cases, construction loans were estimated at 6.5% with loan rates carrying the project from completion of construction to purchase at 5.5%. Construction was estimated to require 6 months to complete with a sales period of 12 months. Savings could be obtained through building units only as demanded rather than the entire project in its entirety, resulting in less interest charged for unsold units.

With present day market conditions including soft demand and increasing vacancy rates, the relatively low price of housing in the area, and population trends including declining forecasted population; the outlook for new market rate housing in the Pendleton area is not optimistic. However, success is more likely given a product that offers a unique design and which can draw on a larger market area. Therefore, the project's success or failure is tied to an accurate match of demand with housing supplied so that carrying costs of unsold inventory is minimized. The benefit of co-housing is that because the group forms prior to the initiation of building, most units have tenants as soon as they are ready for occupancy.

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Figure 2-18 by Lian Chan and Alex O' Briant

Figure 2-30 through 2-32 by Lohren Deeg

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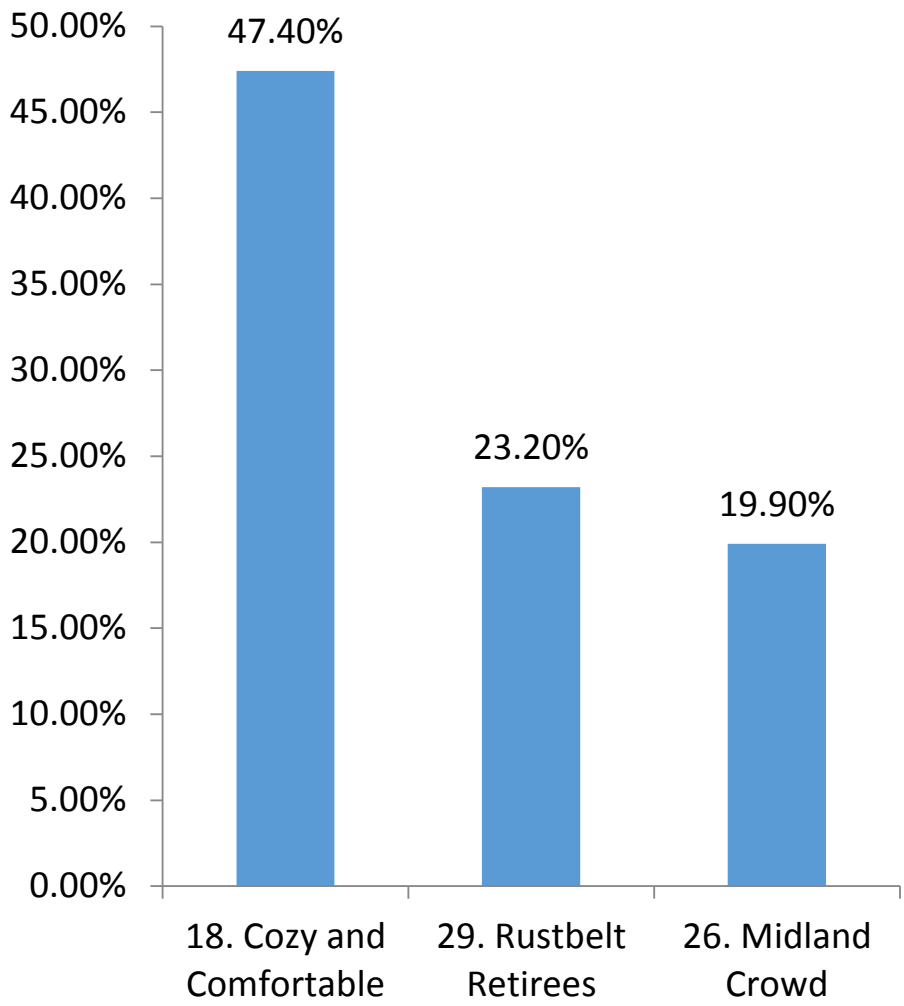
Appendix A:
Images of Site

Appendix B: Images of Pendleton, IN


HISTORIC
PENDLETON

Appendix C: Pendleton Psychographic Groups



18—Cozy and Comfortable

Segment Code—18
Segment Name—Cozy and Comfortable
LifeMode Summary Group—L2 Upscale Avenues
Urbanization Summary Group—U8 Suburban Periphery II

Demographic

Cozy and Comfortable residents are middle-aged married couples who are comfortably settled in their single-family homes in older neighborhoods. The median age of 42.3 years is five years older than the US median of 37 years. Most residents are married without children or married couples with school-aged or adult children. With 8.7 million people, this is a relatively large segment that is growing moderately by 0.48 percent annually since 2000. Most of these residents are white.

Socioeconomic

Although the labor force is older, they are in no hurry to retire. The labor force participation rate is 65.7 percent; the unemployment figure is 9.3 percent. Employed residents work in professional, managerial, and service occupations in a variety of industry sectors. Occupation distributions are similar to US values. The median household income is $65,665. Income for 80 percent of the households is earned from wages and salaries. Forty-six percent of households receive investment income. Their median net worth is $181,850.

Residential

Cozy and Comfortable neighborhoods are located in suburban areas, primarily in the Midwest, Northeast, and South. Many residents are still living in the homes in which they raised their children. Single-family structures make up 88 percent of the household inventory. The median home value is $154,868. Sixty-two percent of the housing units were built before 1970. Home ownership is at 85 percent.

Preferences

Cozy and Comfortable residents prefer to own certificates of deposit and consult a financial planner. They typically hold a second mortgage, a new car loan, a home equity line of credit, and a universal life insurance policy. Home improvement and remodeling projects are important to them. Although they will contract for some work, they attempt many projects, especially painting and lawn care. Depending on the season, they play golf or ice skate for exercise. They attend ice hockey games, watch science fiction movies on DVD, and take domestic vacations. They eat at family restaurants such as Friendly's, Bob Evans Farms, and Big Boy.

Going online isn't a priority, so they own older home computers. Television is very important; many households own four or more sets so they won't miss any of their favorite shows. They watch sports, particularly football, and news programs. Reading the Sunday newspaper is part of the routine for many.

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26—Midland Crowd

Segment Code—26
Segment Name—Midland Crowd

LifeMode Summary Group—L12 American Quilt
Urbanization Summary Group—U10 Rural I

Demographic

The growing population of 12 million, approximately 4 percent of the US population, identifies *Midland Crowd* as Tapestry Segmentation's largest segment. Since 2000, the population has grown by 2.18 percent annually. The median age of 37.2 years parallels that of the US median. Sixty-two percent of the households are married couple families; half of them have children. Twenty percent of the households are singles who live alone. *Midland Crowd* neighborhoods are not diverse.

Socioeconomic

Median household income is $50,096, slightly lower than the US median. Most income is earned from wages and salaries; however, self-employment ventures are slightly higher for this segment than the national average. The median net worth is $88,854. Unemployment is below average. Half of the residents who work hold white collar jobs. More than 45 percent of the residents aged 25 years and older have attended college; 16 percent have earned a bachelor's or graduate degree.

Residential

Midland Crowd residents live in housing developments in rural villages and towns throughout the United States, mainly in the South. Three-fourths of the housing was built after 1969. The home ownership rate is 81 percent, higher than the national rate of 66 percent. The median home value is $121,782. Two-thirds of the housing is single-family houses; 28 percent are mobile homes.

Preferences

These politically active, conservative residents vote, work for their candidates, and serve on local committees. Their rural location and traditional lifestyle dictate their product preferences. A fourth of the households own three or more vehicles; they typically own or lease a truck, and many own a motorcycle. Proficient do-it-yourselfers, they work on their vehicles, homes, and gardens and keep everything in tip-top shape. They hunt, fish, and do woodworking. Dogs are their favorite pets. They patronize local stores or shop by mail order. They have recently bought radial tires. They often go to the drive-through at a fast-food restaurant.

Many households own a satellite dish so they can watch CMT, the Speed Channel, Home & Garden Television, NASCAR racing, rodeo/bull riding, truck and tractor pulls, fishing programs, and a variety of news programs. They listen to country music on the radio and read fishing and hunting magazines.

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29—Rustbelt Retirees

Segment Code—29
Segment Name—Rustbelt Retirees
LifeMode Summary Group—L5 Senior Styles
Urbanization Summary Group—U8 Suburban Periphery II

Demographic

Most of the households in these neighborhoods are married couples with no children or singles who live alone. Twenty percent are married couples with children. The median age is 45.6 years; more than one-third of the householders are aged 65 years or older. Seventeen percent are veterans. These neighborhoods are not ethnically diverse.

Socioeconomic

Although many residents still work, the labor force participation rate is 58 percent. Most households derive income from wages. However, 45 percent of households earn income from interest, dividends, and rental properties; 40 percent draw Social Security benefits; and 28 percent receive retirement income. The median household income is $52,216, just below that of the US median. The median net worth is $130,866, slightly above the US value. Overall, 86 percent of residents aged 25 years and older have graduated from high school, approximately 50 percent have attended college, and 20 percent hold a bachelor's or graduate degree.

Residential

Most *Rustbelt Retirees* neighborhoods can be found in older, industrial northeastern cities, especially in Pennsylvania, and other states surrounding the Great Lakes; 67 percent of the households are located in the Northeast and Midwest. Twenty-eight percent are in the South. Eighty-four percent of the housing is single-family homes with a median home value of $119,104; three-fourths were built before 1970. Unlike many retirees, these residents are content to stay put and live in the same house for years.

Preferences

These hardworking folks are settled; many have lived in the same house for years. Loyal to country and community, they tend to be politically conservative. They participate in public activities and fund-raising, visit elected officials, and work for political parties or candidates. They belong to fraternal organizations, unions, and veterans' clubs. Practical people who take pride in their homes and gardens, *Rustbelt Retirees* buy home furnishings and work on remodeling projects to update their houses. They watch their pennies, use coupons, and look for bargains at discount stores and warehouse clubs. They own savings bonds and certificates of deposit and hold life insurance policies.

They eat out at family restaurants such as Perkins and Friendly's and watch rented movies on DVD instead of going to the theater. They also go bowling, play cards and bingo, gamble in Atlantic City, and go to horse races. They watch home improvement shows, sports events, news programs, game shows, and old reruns on TV. Favorite channels include Home & Garden Television, the Hallmark Channel, and the Weather Channel. They listen to country, oldies, and sports radio and peruse the daily newspaper.
